

SECTION 1: Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· Trade name: **Testomat 2000 Indikator TH 2025**

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**

No further relevant information available.

· **Application of the substance / the preparation:** Reagent for analysis

· **1.3 Details of the supplier of the safety data sheet**

· **Manufacturer/Supplier:**

Gebrüder Heyl
Analysetechnik GmbH & Co. KG
Orleansstraße 75 b
D-31135 Hildesheim

Phone +49 (0) 5121 2893390

Fax +49 (0) 5121 2893367

E-Mail info@heyl.de

Internet www.heyl.de

· **Further information obtainable from:** product safety department

· **1.4 Emergency telephone number:**

Giftinformationszentrum Nord
Phone +49 (0) 551 19240

SECTION 2: Hazards identification

· **2.1 Classification of the substance or mixture**

· Classification according to Regulation (EC) No 1272/2008



GHS07

Eye Irrit. 2 H319 Causes serious eye irritation.

· **2.2 Label elements**

· **Labelling according to Regulation (EC) No 1272/2008**

The product is classified and labelled according to the CLP regulation.

· **Hazard pictograms**



GHS07

· **Signal word** Warning

· **Hazard statements**

H319 Causes serious eye irritation.

· **Precautionary statements**

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313 If eye irritation persists: Get medical advice/attention.

· **Labelling of packages where the contents do not exceed 125 ml**

· **Hazard pictograms**



GHS07

· **Signal word** Warning

· **Hazard statements** Void

· **Precautionary statements** Void

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- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Description:

Mixture of substances listed below with nonhazardous additions according to Regulation (EC) No 1272/2008.

Dangerous components:

CAS: 110-97-4 EINECS: 203-820-9 Index number: 603-083-00-7 Reg.nr.: 01-2119475444-34	1,1'-iminodipropan-2-ol ⚠ Eye Irrit. 2, H319	10-25%
CAS: 15708-48-2 EINECS: 239-803-8	Ethylendiamintetraacetic acid dipotassiummagnesium salt ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	0.1-≤2.5%

- **SVHC** Not applicable.
- **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

- **General information:** Immediately remove any clothing soiled by the product.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.
- **After eye contact:**
Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:**
A person vomiting while laying on their back should be turned onto their side.
Rinse out mouth and then drink plenty of water.
Seek medical treatment.
- **4.2 Most important symptoms and effects, both acute and delayed**
No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **5.2 Special hazards arising from the substance or mixture**
No further relevant information available.
- **5.3 Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.

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SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures**
Wear personal protection equipment.
- **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of the material collected according to regulations.
Clean the affected area carefully; suitable cleaners are:
Warm water
- **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
- **Information about fire - and explosion protection:** No special measures required.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store only in the original receptacle.
- **Information about storage in one common storage facility:** Store away from foodstuffs.
- **Further information about storage conditions:**
Keep container tightly sealed.
Protect from heat and direct sunlight.
Store receptacle in a well ventilated area.
- **Recommended storage temperature:** 15 - 25 °C
- **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **8.1 Control parameters**
- **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.
- **8.2 Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
The usual precautionary measures are to be adhered to when handling chemicals.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Do not eat, drink, smoke or sniff while working.
- **Respiratory protection:** Not required.

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Protection of hands:



Protective gloves

Wear gloves according to EN 374.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Check protective gloves prior to each use for their proper condition.

Preventive skin protection by use of skin-protecting agents is recommended.

After use of gloves apply skin-cleaning agents and skin cosmetics.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

For the permanent contact gloves made of the following materials are suitable:

Nitrile rubber, NBR

Recommended thickness of the material: ≥ 0.4 mm

Value for the permeation: Level = 6 (> 480 min)

As protection from splashes gloves made of the following materials are suitable:

Nitrile rubber, NBR

Recommended thickness of the material: ≥ 0.12 mm

Value for the permeation: Level = 2 (> 30 min)

Eye protection:



Tightly sealed goggles according to EN 166

Body protection: Protective work clothing

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance:

Form: Fluid

Colour: Green

Odour: Characteristic

pH-value (100 g/l) at 20 °C: 10.2

Change in condition

Melting point/freezing point: Undetermined.

Initial boiling point and boiling range: Undetermined.

Flash point: Not applicable.

Auto-ignition temperature: Product is not selfigniting.

Explosive properties: Product does not present an explosion hazard.

Density at 20 °C: 1.11 g/cm³

Solubility in / Miscibility with water: Fully miscible.

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9.2 Other information

No further relevant information available.

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
Exothermic neutralisation reaction with acids.
Under certain conditions possible formation of nitrosamines in the presence of nitrites or reagents causing nitrosation.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:**
Acids, nitrites, reagents causing nitrosation.
Do not use tools made of aluminium or copper or their alloys.
- **10.6 Hazardous decomposition products:** Nitrogen oxides

SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity** Based on available data, the classification criteria are not met.
- **LD/LC50 values relevant for classification:**
- **CAS: 110-97-4 1,1'-iminodipropan-2-ol**
- Oral | LD50 | 4770 mg/kg (rat)
- **CAS: 15708-48-2 Ethylendiamintetraacetic acid dipotassiummagnesium salt**
- Oral | LD50 | > 2000 mg/kg (rat)
- **Primary irritant effect:**
- **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
- **Serious eye damage/irritation**
Causes serious eye irritation.
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

- **12.1 Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.

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- vPvB: Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

- **13.1 Waste treatment methods**
- **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
Disposal must be made according to official regulations.
- **Uncleaned packaging:**
- **Recommendation:**
Packagings that may not be cleansed are to be disposed of in the same manner as the product.
Disposal must be made according to official regulations.
- **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

SECTION 14: Transport information

- | | |
|--|--|
| · 14.1 UN-Number | Void |
| · ADR, ADN, IMDG, IATA | Void |
| · 14.2 UN proper shipping name | Void |
| · ADR, ADN, IMDG, IATA | Void |
| · 14.3 Transport hazard class(es) | Void |
| · ADR, ADN, IMDG, IATA | Void |
| · Class | Void |
| · 14.4 Packing group | Void |
| · ADR, IMDG, IATA | Void |
| · 14.5 Environmental hazards: | |
| · Marine pollutant: | No |
| · 14.6 Special precautions for user | Not applicable. |
| · 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code | Not applicable. |
| · Transport/Additional information: | Not dangerous according to the above specifications. |
| · UN "Model Regulation": | Void |

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Directive 2012/18/EU**
- **Named dangerous substances - ANNEX I** None of the ingredients is listed.
- **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3
- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

· **Department issuing SDS:** product safety department.

· **Contact:**

· **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

SVHC: Substances of Very High Concern

vPvB: very Persistent and very Bioaccumulative

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

· *** Data compared to the previous version altered.**

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Паспорт безопасности

в соответствии с Регламентом (ЕС) № 1907/2006

424-32 Hardness 1 Buffer

Дата ревизии: 23.04.2018

Код продукта: 42432

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РАЗДЕЛ 1: Идентификация химической продукции и сведения о производителе или поставщике

1.1. Идентификатор продукта

424-32 Hardness 1 Buffer

1.2. Соответствующие установленные области применения вещества или смеси и применение, рекомендованное против

1.3. Данные о поставщике в паспорте безопасности

Компания: HACH LANGE GmbH
Улица: Willstätterstr. 11
Город: D-40549 Düsseldorf
Телефон: +49 (0)211 5288-383
Электронная почта: SDS@hach.com
Интернет: www.de.hach.com
Ответственный Департамент: ООО «ХАХ ЛАНГЕ»
Деловой комплекс «Санкт-Петербург Плаза»
Россия, 195112, Санкт-Петербург
Тел. +7 495 664 75 05
Тел. +7 812 324 13 93 * Факс +7 812 320 20 53

РАЗДЕЛ 2: Идентификация опасности (опасностей)

2.1. Классификация вещества или смеси

Регламентом (ЕС) № 1272/2008

Категории опасности:
Разъедание/раздражение кожи: Skin Irrit. 2
Серьезное повреждение/раздражение глаз: Eye Irrit. 2
Опасности для водной среды: Aquatic Chronic 3
Указание на опасность:
При попадании на кожу вызывает раздражение.
При попадании в глаза вызывает выраженное раздражение.
Вредно для водных организмов с долгосрочными последствиями.

2.2. Элементы маркировки

Регламентом (ЕС) № 1272/2008

Опасные компоненты, которые должны упоминаться на этикетке
2-амино-2-метилпропанол

Сигнальное слово: Внимание

Пиктограмма:



Указание на опасность

H315 При попадании на кожу вызывает раздражение.
H319 При попадании в глаза вызывает выраженное раздражение.
H412 Вредно для водных организмов с долгосрочными последствиями.

Предупреждения

P273 Избегать попадания в окружающую среду.
P280 Использовать перчатки/спецодежду/средства защиты глаз/лица.
P302+P352 ПРИ ПОПАДАНИИ НА КОЖУ: Промыть большим количеством воды.
P305+P351+P338 ПРИ ПОПАДАНИИ В ГЛАЗА: Осторожно промыть глаза водой в течение нескольких

Паспорт безопасности

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минут. Снять контактные линзы, если Вы ими пользуетесь, и если это легко сделать.
 Продолжить промывание глаз.
 Обратиться за медицинской помощью при плохом самочувствии.
 Утилизировать содержимое/контейнер в соответствии с местными ограничениями.

P312

P501

Дополнительная рекомендация

Продукт относится к классу опасных в соответствии с Регламентом (ЕС) No. 1272/2008.

2.3. Другие опасности

не имеются данные

РАЗДЕЛ 3: Состав (информация о компонентах)
3.2. Смеси
Опасные компоненты

Номер CAS	название			часть
	Номер ЕС	Номер Индекс	Номер REACH	
	Классификация СГС			
124-68-5	2-амино-2-метилпропанол			50-60 %
	204-709-8	603-070-00-6		
	Skin Irrit. 2, Eye Irrit. 2, Aquatic Chronic 3; H315 H319 H412			
7732-18-5	вода			35-45 %
	231-791-2			
64-19-7	уксусная кислота ... %			1-10 %
	200-580-7	607-002-00-6		
	Flam. Liq. 3, Skin Corr. 1A; H226 H314			
14402-88-1	Этилендиаминтетрауксусной кислоты динатрий-магниевая соль			<1 %
	238-372-3			

Текст H-фраз: смотри в разделе 16.

РАЗДЕЛ 4: Меры первой помощи
4.1. Описание мер первой помощи
Общие рекомендации

Немедленно снять зараженную одежду и обувь.
 Показать эти правила техники безопасности оказывающему помощь врачу.

При вдыхании

Перенести на свежий воздух.
 Если симптомы не исчезнут, вызвать врача.

При попадании на кожу

Немедленно промыть большим количеством воды на протяжении минимум 15 минут.
 Немедленно снять всю зараженную одежду.
 В случае продолжения раздражения кожи вызвать врача.

При контакте с глазами

Тщательно промыть большим количеством воды минимум 15 минут и получить консультацию у врача.

При попадании в желудок

Прополоскать рот водой и затем выпить большое количество воды. Получить консультацию у врача.

4.2. Наиболее существенные симптомы/эффект острого воздействия


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раздражающие эффекты

4.3. Указание на необходимость немедленной медицинской помощи и специальное лечение

Лечить симптоматично.

РАЗДЕЛ 5: Меры и средства обеспечения пожаровзрывобезопасности**5.1. Средства пожаротушения****Подходящие средства пожаротушения**

Использовать меры тушения, которые подходят к местным обстоятельствам и к окружающей среде. Сам по себе продукт не горит.

Неподходящие средства пожаротушения

Нет предела

5.3. Меры предосторожности для пожарных

При пожаре надеть автономный дыхательный аппарат.

При наличии вдыхаемой пыли и/или дыма, использовать автономный дыхательный аппарат и пыленепроницаемый защитный костюм.

Дополнительная рекомендация

Утилизация остатков сгорания и загрязненной воды для пожаротушения должна осуществляться в соответствии с местными нормативами.

РАЗДЕЛ 6: Меры по предотвращению и ликвидации аварийных и чрезвычайных ситуаций и их последствий**6.1. Меры предосторожности для персонала, защитное снаряжение и чрезвычайные меры**

Использовать персональное защитное оборудование. Право доступа имеет только квалифицированный персонал, снаряженный подходящим защитным оборудованием. Немедленно эвакуировать персонал в безопасное место.

Избегать вдыхания паров/тумана/газа.

6.2. Предупредительные меры по охране окружающей среды

Не смывать в поверхностную воду или в канализационную систему.

6.3. Методы и материалы для локализации и очистки

Впитать инертным поглощающим материалом и удалить как опасные отходы.

6.4. Ссылка на другие разделы

13. Рекомендации по удалению отходов (остатков)

РАЗДЕЛ 7: Правила хранения химической продукции и обращения с ней при погрузочно-разгрузочных работах**7.1. Меры предосторожности при работе с продуктом****Информация о безопасном обращении**

Использовать только в хорошо проветриваемых помещениях.

Избегать попадания на кожу и в глаза.

Не вдыхать испарения/пыль.

Рекомендации по защите от возгорания и взрыва

Не известны.

Так же смотри секцию 5

Дальнейшие указания

Соблюдать меры предосторожности, указанные на этикетках.

Избегать попадания на кожу, в глаза и на одежду.

7.2. Условия для безопасного хранения с учетом любых несовместимостей**Требования в отношении складских зон и тары**

Хранить в сухом, прохладном месте.





Be Right™

HACH LANGE GmbH

Паспорт безопасности

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Указания по совместному хранению

Не хранить наряду с Окисляющие вещества

РАЗДЕЛ 8: Средства контроля за опасным воздействием и средства индивидуальной защиты

8.1. Параметры контроля

Предельно допустимые концентрации (ПДК) вредных веществ в воздухе рабочей зоны

№ CAS	Наименование вещества	ppm	мг/м3	Величина ПДК
64-19-7	Этановая кислота		5	(максимальная)

Дополнительные указания к граничным значениям

Не известны.

8.2. Регулирования воздействия

Защитные и гигиенические меры

Выбор средств защиты должен осуществляться в соответствии с концентрацией и количеством опасного вещества в конкретном производственном помещении.

Общие правила промышленной гигиены.

Защита глаз/лица

Защитные очки с боковыми щитками

Защита рук

Хемозащитные перчатки, изготовленные из бутилкаучука или нитрилового каучука категории III согласно стандарту EN 374.

Обратиться за консультацией к вашему поставщику, если материал будет использоваться в особых целях, например в пищевой промышленности или для окончательного использования в гигиенических, медицинских или хирургических целях.

Защита кожи

Снять и вымыть зараженную одежду перед повторным употреблением.

Защита дыхательных путей

Дыхательный аппарат только при образовании пыли или аэрозоля.

Рекомендуемый тип фильтра: Фильтр АВЕК

Регулирование воздействия на окружающую среду

Не должно быть высвобождено в окружающую среду.

РАЗДЕЛ 9: Физико-химические свойства

9.1. Информация об основных физико-химических свойствах

Физическое состояние вещества: жидкость

Цвет: желтый

Запах: уксусный

pH (при 20 °C): 10 (2 % раствор)

Изменения состояния

Точка плавления: не применимо

Начальная точка кипения и интервал кипения: 104,5 °C

Точка сублимации: не применимо

Точка размягчения: не применимо

Температура текучести: не имеются данные

: не имеются данные

Точка вспышки: >97,2 °C



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Директор К.А. Половников

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Указания по совместному хранению

Не хранить наряду с Окисляющие вещества

РАЗДЕЛ 8: Средства контроля за опасным воздействием и средства индивидуальной защиты

8.1. Параметры контроля

Предельно допустимые концентрации (ПДК) вредных веществ в воздухе рабочей зоны

№ CAS	Наименование вещества	ppm	мг/м3	Величина ПДК
64-19-7	Этановая кислота		5	(максимальная)

Дополнительные указания к граничным значениям

Не известны.

8.2. Регулирования воздействия

Защитные и гигиенические меры

Выбор средств защиты должен осуществляться в соответствии с концентрацией и количеством опасного вещества в конкретном производственном помещении.

Общие правила промышленной гигиены.

Защита глаз/лица

Защитные очки с боковыми щитками

Защита рук

Хемозащитные перчатки, изготовленные из бутилкаучука или нитрилового каучука категории III согласно стандарту EN 374.

Обратиться за консультацией к вашему поставщику, если материал будет использоваться в особых целях, например в пищевой промышленности или для окончательного использования в гигиенических, медицинских или хирургических целях.

Защита кожи

Снять и вымыть зараженную одежду перед повторным употреблением.

Защита дыхательных путей

Дыхательный аппарат только при образовании пыли или аэрозоля.

Рекомендуемый тип фильтра: Фильтр АВЕК

Регулирование воздействия на окружающую среду

Не должно быть высвобождено в окружающую среду.

РАЗДЕЛ 9: Физико-химические свойства

9.1. Информация об основных физико-химических свойствах

Физическое состояние вещества: жидкость

Цвет: желтый

Запах: уксусный

pH (при 20 °C): 10 (2 % раствор)

Изменения состояния

Точка плавления: не применимо

Начальная точка кипения и интервал кипения: 104,5 °C

Точка сублимации: не применимо

Точка размягчения: не применимо

Температура текучести: не имеются данные

; не имеются данные

Точка вспышки: >97,2 °C



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Горючесть

твердого тела: не имеются данные
газа: не имеются данные

Взрывоопасные свойства

не имеются данные

Нижний предел экспозиции: не применимо

Верхний предел экспозиции: не применимо

Температура воспламенения: не имеются данные

Температура самовозгорания

твердого тела: не имеются данные

газа: не имеются данные

Температура разложения: не имеются данные

Окисляющие свойства

не имеются данные

Давление пара: не имеются данные

Давление пара: не имеются данные

Плотность (при 20 °C): 1,033 g/cm³

Насыпная плотность: не применимо

Растворимость в воде: полностью растворимый

(при 20 °C)

Растворимость в других растворителях

не имеются данные

Коэффициент распределения: не имеются данные

Вязкость, динамическая: не имеются данные

Вязкость, кинематическая: не имеются данные

Показатель текучести для вязких жидкостей: не имеются данные

Плотность пара: не имеются данные

Скорость испарения: 0,36

(при 20 °C)

Тест на разделение растворителя: не имеются данные

Содержание растворителя: не имеются данные

9.2. Другие данные

Содержание твердых веществ: не имеются данные

не имеются данные

РАЗДЕЛ 10: Стабильность и реакционная способность

10.1. Реакционная способность

Опасность, связанная с реакционной способностью: Окисляющие вещества

10.2. Химическая устойчивость

Продукт химически стойкий.

10.3. Возможность опасных реакций

Реагирует с такими веществами: Окисляющие вещества

10.4. Условия, которых следует избегать

Экстремальные температуры и прямой солнечный свет.



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10.5. Несовместимые материалы, которых следует избегать

Не известны.

10.6. Опасные продукты разложения

Углекислый газ (CO₂), угарный газ (CO), оксиды азота (NO_x), густой черный дым.

РАЗДЕЛ 11: Информация о токсичности

11.1. Данные о токсикологическом воздействии

Острая токсичность

О самом продукте не имеется никаких данных.

CAS-Номер	название	Путь воздействия вредных веществ	Доза	Виды	Источник	Метод
124-68-5	2-амино-2-метилпропанол	оральный	LD50 2900 mg/kg	Крыса	IUCLID	
		кожный	LD50 > 2000 mg/kg	Кролик	IUCLID	
64-19-7	уксусная кислота ... %	оральный	LD50 3310 mg/kg	Крыса	GESTIS	

Раздражение и коррозия

Раздражает глаза и кожу.

Сенсибилизирующее действие

Действие не известно.

Канцерогенные, мутационные последствия, а также скорость их распространения

Не содержит ингредиентов, входящих в список канцерогенов

Специфическая токсичность для отдельного органа-мишени при однократном воздействии

Вещество или смесь не относятся к классу специфических токсических веществ для органа-мишени, при единичном воздействии.

Специфическая токсичность для отдельного органа-мишени при многократном воздействии

Вещество или смесь не относятся к классу специфических токсических веществ для органа-мишени, при неоднократном воздействии.

Опасно при вдыхании

Отсутствие классификации по токсичности при вдыхании

Специфические / особые симптомы в опытах с животными

О самом продукте не имеется никаких данных.

Дальнейшие указания

Нельзя исключать наличие других опасных свойств. Обращаться в соответствии с правилами безопасности и промышленной гигиены.

РАЗДЕЛ 12: Информация о воздействии на окружающую среду

12.1. Токсичность

О самом продукте не имеется никаких данных.



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CAS-Номер	название			[h] [d]	Виды	Источник	Метод
	Водная токсичность	Доза					
124-68-5	2-амино-2-метилпропанол						
	Острая токсичность для рыб	LC50	190 mg/l	96 h	Lepomis macrochirus	IUCLID	
	Острая водорослевая токсичность	ErC50	520 mg/l	72 h	Desmodesmus subspicatus		
64-19-7	уксусная кислота ... %						
	Острая Crustacea токсичность	EC50	65 mg/l	48 h	Daphnia magna	Janssen et al	

12.2. Стойкость и разлагаемость

О самом продукте не имеется никаких данных.

12.3. Потенциал биоаккумуляции

О самом продукте не имеется никаких данных.

Коефициент распределения (н-октанол/вода)

CAS-Номер	название	Log Pow
124-68-5	2-амино-2-метилпропанол	-0,74
64-19-7	уксусная кислота ... %	-0,17

12.4. Мобильность в почве

не имеются данные

12.5. Результаты оценки PBT и vPvB

не имеются данные

12.6. Другие неблагоприятные воздействия

Не смывать в поверхностную воду или в канализационную систему.

РАЗДЕЛ 13: Рекомендации по удалению отходов (остатков)
13.1. Методы утилизации отходов
Рекомендация

В соответствии с местными и государственными ограничениями.

Утилизация неочищенной упаковки и рекомендуемые средства очистки

Удалить в качестве неиспользованного продукта.

РАЗДЕЛ 14: Информация при перевозках (транспортировании)
Сухопутный транспорт (ADR/RID)
Другая дополнительная информация (Наземный транспорт)

Товар не подлежит регулированию нормами транспортного законодательства

Морская доставка (IMDG)
Другая дополнительная информация (Морской транспорт)

Товар не подлежит регулированию нормами транспортного законодательства

Воздушный транспорт (ICAO-TI/IATA-DGR)
Другая дополнительная информация (Воздушный транспорт)

Товар не подлежит регулированию нормами транспортного законодательства

14.5. Опасность вредного воздействия на окружающую среду

ОПАСНО ДЛЯ ОКРУЖАЮЩЕЙ СРЕДЫ: нет





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14.6. Специальные меры предосторожности для пользователя

не имеются данные

14.7. Перевозка массовых грузов в соответствии с Приложением II МАРПОЛ 73/789 и Кодексом МКХ

Не относится

РАЗДЕЛ 15: Информация о национальном и международном законодательстве**15.1. Нормативы по охране и гигиене труда и природоохранительное законодательство/нормативы, характерные для данного вещества или смеси.**

Национальные предписания

Класс загрязнения воды (D): 2 - опасен для воды

РАЗДЕЛ 16: Дополнительная информация**Редакционные примечания**

Редакция: 23.04.2018

Обновленные разделы паспорта безопасности: 8, 11, 16

Редакция: 23.04.2015

Обновленные разделы паспорта безопасности: 2

Редакция: 25.02.2015

Обновленные разделы паспорта безопасности: 2, 10

Редакция: 06.11.2013

Классификация смесей и использованный метод оценки согласно СГС

Классификация	Процедура классификации
Skin Irrit. 2; H315	Процесс расчета
Eye Irrit. 2; H319	Процесс расчета
Aquatic Chronic 3; H412	Процесс расчета

Текст H-фраз (Номер и полный текст)

H226	Воспламеняющаяся жидкость. Пары образуют с воздухом взрывоопасные смеси.
H314	При попадании на кожу и в глаза вызывает химические ожоги.
H315	При попадании на кожу вызывает раздражение.
H319	При попадании в глаза вызывает выраженное раздражение.
H412	Вредно для водных организмов с долгосрочными последствиями.

Дополнительная информация

Данные базируются на сегодняшнем уровне наших знаний, однако они не представляют собой гарантию свойств продукта и не являются основой для договорных правовых связей.

(Данные по опасным ингредиентам были взяты из информационных листов по технике безопасности субподрядчиков в их последней актуальной редакции.)



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Директор К.А. Половников

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РАЗДЕЛ 1: Идентификация химической продукции и сведения о производителе или поставщике**1.1. Идентификатор продукта**

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1.2. Соответствующие установленные области применения вещества или смеси и применение, рекомендованное против**1.3. Данные о поставщике в паспорте безопасности**

Компания:	HACH LANGE GmbH
Улица:	Willstdtterstr. 11
Город:	D-40549 Dьsseldorf
Телефон:	+49 (0)211 5288-383
Электронная почта:	SDS@hach.com
Интернет:	www.de.hach.com
Ответственный Департамент:	ООО «ХАХ ЛАНГЕ» Деловой комплекс «Санкт-Петербург Плаза» Россия, 195112, Санкт-Петербург Тел. +7 495 664 75 05 Тел. +7 812 324 13 93 * Факс +7 812 320 20 53

РАЗДЕЛ 2: Идентификация опасности (опасностей)**2.1. Классификация вещества или смеси**

Регламентом (ЕС) № 1272/2008

Категории опасности:
Вещества, вызывающие коррозию металлов: Met. Corr. 1
Воспламеняющиеся жидкости: Flam. Liq. 3
Разъедание/раздражение кожи: Skin Corr. 1
Серьезное повреждение/раздражение глаз: Eye Dam. 1
Респираторная или кожная сенсibilизация: Skin Sens. 1
Канцерогенность: Carc. 2
Специфическая избирательная токсичность, поражающая отдельные органы-мишени в результате многократного воздействия: STOT RE 2
Указание на опасность:
Может вызывать коррозию металлов.
Воспламеняющаяся жидкость. Пары образуют с воздухом взрывоопасные смеси.
При попадании на кожу и в глаза вызывает химические ожоги.
При попадании в глаза вызывает необратимые последствия.
При контакте с кожей может вызывать аллергическую реакцию.
Предполагается, что данное вещество вызывает раковые заболевания.
Может поражать органы в результате многократного или продолжительного воздействия.

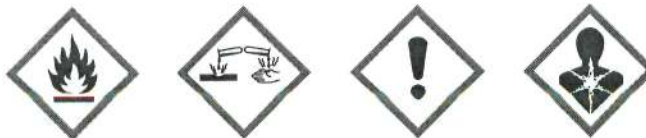
2.2. Элементы маркировки

Регламентом (ЕС) № 1272/2008

Опасные компоненты, которые должны упоминаться на этикетке
hydroxylammonium chloride; hydroxylamine hydrochloride
2-пропанол

Сигнальное слово: Опасность

Пиктограмма:



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Указание на опасность

H226	Воспламеняющаяся жидкость. Пары образуют с воздухом взрывоопасные смеси.
H290	Может вызывать коррозию металлов.
H314	При попадании на кожу и в глаза вызывает химические ожоги.
H317	При контакте с кожей может вызывать аллергическую реакцию.
H351	Предполагается, что данное вещество вызывает раковые заболевания.
H373	Может поражать органы в результате многократного или продолжительного воздействия.

Предупреждения

P210	Беречь от источников воспламенения/нагревания/искр/открытого огня. Не курить.
P243	Беречь от статического электричества.
P304+P340	ПРИ ВДЫХАНИИ: Свежий воздух, покой.
P305+P351+P338	ПРИ ПОПАДАНИИ В ГЛАЗА: Осторожно промыть глаза водой в течение нескольких минут. Снять контактные линзы, если Вы ими пользуетесь, и если это легко сделать. Продолжить промывание глаз.
P303+P361+P353	ПРИ ПОПАДАНИИ НА КОЖУ (или волосы): Немедленно снять всю загрязненную одежду, кожу промыть водой или под душем.
P301+P330+P331	ПРИ ПРОГЛАТЫВАНИИ: Прополоскать рот. Не вызывать рвоту!
P310	Немедленно обратиться за медицинской помощью.

Дополнительная рекомендация

Продукт относится к классу опасных в соответствии с Регламентом (ЕС) No. 1272/2008.

2.3. Другие опасности

В случае некомпетентного использования или утилизации нельзя исключить опасного воздействия на окружающую среду.

РАЗДЕЛ 3: Состав (информация о компонентах)
3.2. Смеси
Опасные компоненты

Номер CAS	название			часть
	Номер ЕС	Номер Индекс	Номер REACH	
	Классификация СГС			
57-55-6	1,2-пропандиол			90-100 %
	200-338-0			
5470-11-1	hydroxylammonium chloride; hydroxylamine hydrochloride			1-10 %
	226-798-2	612-123-00-2		
	Met. Corr. 1, Carc. 2, Acute Tox. 4, Acute Tox. 4, Skin Irrit. 2, Eye Irrit. 2, Skin Sens. 1, STOT RE 2, Aquatic Acute 1; H290 H351 H312 H302 H315 H319 H317 H373 H400			
67-63-0	2-пропанол			< 5 %
	200-661-7	603-117-00-0		
	Flam. Liq. 2, Eye Irrit. 2, STOT SE 3; H225 H319 H336			
3147-14-6	Кальмагит			< 1 %
	221-563-0			
	Skin Irrit. 2, Eye Irrit. 2, STOT SE 3; H315 H319 H335			

Текст H-фраз: смотри в разделе 16.

РАЗДЕЛ 4: Меры первой помощи
4.1. Описание мер первой помощи

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Общие рекомендации

Немедленно снять всю зараженную одежду. Показать эти правила техники безопасности оказывающему помощь врачу.

При вдыхании

Перенести на свежий воздух. В серьезном случае получить консультацию у врача.

При попадании на кожу

Смыть водой с мылом. В случае продолжения раздражения кожи вызвать врача.

При контакте с глазами

Тщательно промыть большим количеством воды минимум 15 минут и получить консультацию у врача. Показать эти правила техники безопасности оказывающему помощь врачу.

При попадании в желудок

Прополоскать рот водой и затем выпить большое количество воды. НЕ вызывать рвоту. Показать эти правила техники безопасности оказывающему помощь врачу.
Никогда не следует давать что-либо через рот человеку, находящемуся без сознания.

4.2. Наиболее существенные симптомы/эффект острого воздействия

Раздражение и коррозия. Может повлечь аллергическую реакцию. Может поглощаться через кожу.

4.3. Указание на необходимость немедленной медицинской помощи и специальное лечение

Лечить симптоматично.

РАЗДЕЛ 5: Меры и средства обеспечения пожаровзрывобезопасности**5.1. Средства пожаротушения****Подходящие средства пожаротушения**

Использовать меры тушения, которые подходят к местным обстоятельствам и к окружающей среде.
Вода, Сухой порошок, Углекислый газ (CO₂), Спиртостойкая пена

Неподходящие средства пожаротушения

Нет предела

5.2. Особые факторы риска, источником которых является вещество или смесь

Угарный газ, Углекислый газ (CO₂), Кислотных хлоридов

5.3. Меры предосторожности для пожарных

При наличии вдыхаемой пыли и/или дыма, использовать автономный дыхательный аппарат и пыленепроницаемый защитный костюм.

Дополнительная рекомендация

Утилизация остатков сгорания и загрязненной воды для пожаротушения должна осуществляться в соответствии с местными нормативами.
Не допускать загрязнения поверхностных или грунтовых вод водой от пожаротушения.

РАЗДЕЛ 6: Меры по предотвращению и ликвидации аварийных и чрезвычайных ситуаций и их последствий**6.1. Меры предосторожности для персонала, защитное снаряжение и чрезвычайные меры**

Использовать персональное защитное оборудование. Право доступа имеет только квалифицированный персонал, снаряженный подходящим защитным оборудованием. Немедленно эвакуировать персонал в безопасное место.
Избегать вдыхания паров/тумана/газа.

6.2. Предупредительные меры по охране окружающей среды

Не смывать в поверхностную воду или в канализационную систему.

6.3. Методы и материалы для локализации и очистки

Локализовать пролитый материал, собрать его с помощью негорючего абсорбирующего материала (например, песок, земля, диатомовая земля, вермикулит) и перенести в емкость для утилизации согласно местным/государственным нормативам (см. раздел 13).



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6.4. Ссылка на другие разделы

13. Рекомендации по удалению отходов (остатков)

РАЗДЕЛ 7: Правила хранения химической продукции и обращения с ней при погрузочно-разгрузочных работах

7.1. Меры предосторожности при работе с продуктом

Информация о безопасном обращении

Избегать попадания на кожу и в глаза. Использовать только в хорошо проветриваемых помещениях. Не вдыхать испарения или распыленный туман.

Рекомендации по защите от возгорания и взрыва

Не известны.

Так же смотри секцию 5 Соблюдать меры предосторожности, указанные на этикетках.

Дальнейшие указания

Соблюдать меры предосторожности, указанные на этикетках.

7.2. Условия для безопасного хранения с учетом любых несовместимостей

Требования в отношении складских зон и тары

Держать вдали от открытого огня, горячих поверхностей и источников возгорания.

Указания по совместному хранению

Несовместимо с окисляющими средствами.

РАЗДЕЛ 8: Средства контроля за опасным воздействием и средства индивидуальной защиты

8.1. Параметры контроля

Предельно допустимые концентрации (ПДК) вредных веществ в воздухе рабочей зоны

№ CAS	Наименование вещества	ppm	мг/м3	Величина ПДК
57-55-6	Пропан-1,2-диол		7	(максимальная)
67-63-0	Пропан-2-ол		10	(среднесменная)
			50	(максимальная)

Дополнительные указания к граничным значениям

Не известны.

8.2. Регулирования воздействия

Защитные и гигиенические меры

Выбор средств защиты должен осуществляться в соответствии с концентрацией и количеством опасного вещества в конкретном производственном помещении.

Общие правила промышленной гигиены.

Защита глаз/лица

Защитные очки с боковыми щитками

Защита рук

Хемозащитные перчатки, изготовленные из бутилкаучука или нитрилового каучука категории III согласно стандарту EN 374.

Обратиться за консультацией к вашему поставщику, если материал будет использоваться в особых целях, например в пищевой промышленности или для окончательного использования в гигиенических, медицинских или хирургических целях.

Защита кожи

Избегать попадания на кожу, в глаза и на одежду.

Защита дыхательных путей

Обеспечить адекватную вентиляцию.



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Избегать вдыхания пыли или паров.
Дыхательный аппарат необходим только когда образовался туман или аэрозоль.
Рекомендуемый тип фильтра: Фильтр АВЕК

Регулирование воздействия на окружающую среду

Не смывать в поверхностную воду или в канализационную систему.

РАЗДЕЛ 9: Физико-химические свойства

9.1. Информация об основных физико-химических свойствах

Физическое состояние вещества:	жидкость	
Цвет:	темно-красный	
Запах:	приятный, фруктовый	
pH (при 20 °C):		1,09
Изменения состояния		
Точка плавления:		не применимо
Начальная точка кипения и интервал кипения:		118 °C
Точка сублимации:		не применимо
Точка размягчения:		не применимо
Температура текучести:		не имеются данные
:		не имеются данные
Точка вспышки:		25,7 °C
Горючесть		
твердого тела:		не имеются данные
газа:		не имеются данные
Взрывоопасные свойства		
не применимо		
Нижний предел экспозиции:		не имеются данные
Верхний предел экспозиции:		не имеются данные
Температура воспламенения:		не имеются данные
Температура самовозгорания		
твердого тела:		не имеются данные
газа:		не имеются данные
Температура разложения:		не имеются данные
Окисляющие свойства		
не имеются данные		
Давление пара:		не имеются данные
Плотность (при 20 °C):		1,01 g/cm ³
Насыпная плотность:		не применимо
Растворимость в воде: (при 20 °C)		растворимый
Растворимость в других растворителях		
не имеются данные		
Коэффициент распределения:		не имеются данные
Вязкость, динамическая:		не имеются данные
Вязкость, кинематическая:		не имеются данные




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Показатель текучести для вязких жидкостей:	не имеются данные
Плотность пара:	не имеются данные
Скорость испарения:	не имеются данные
Тест на разделение растворителя:	не имеются данные
Содержание растворителя:	не имеются данные

9.2. Другие данные

Содержание твердых веществ:	не имеются данные
Может вызывать коррозию металлов.	
Алюминий 0,001 in/yg	
Мягкая сталь: 0,288 in/yg	

РАЗДЕЛ 10: Стабильность и реакционная способность

10.1. Реакционная способность

Может вызывать коррозию металлов.

10.2. Химическая устойчивость

Стабилен при соблюдении рекомендуемых условий хранения.

10.3. Возможность опасных реакций

Реагирует с такими веществами: Окисляющие вещества

10.4. Условия, которых следует избегать

Теплота, огонь и искры. Для избежания термального разложения, не перегревать.

10.5. Несовместимые материалы, которых следует избегать

Не известны.

10.6. Опасные продукты разложения

Угарный газ, Углекислый газ (CO₂), Кислотных хлоридов

РАЗДЕЛ 11: Информация о токсичности

11.1. Данные о токсикологическом воздействии

Токсикокинетика, метаболизм и распределение

Токсикологическая информация отсутствует.

Острая токсичность

О самом продукте не имеется никаких данных.



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CAS-Номер	название				
	Путь воздействия вредных веществ	Доза	Виды	Источник	Метод
57-55-6	1,2-пропандиол				
	оральный	LD50 20000 mg/kg	крыса	Toxicology and Appli	
	кожный	LD50 20800 mg/kg	кролик	Raw Material Data Ha	
5470-11-1	hydroxylammonium chloride; hydroxylamine hydrochloride				
	оральный	LD50 141 mg/kg	крыса		
	кожный	ATE 1100 mg/kg			
67-63-0	2-пропанол				
	оральный	LD50 5045 mg/kg	крыса	RTECS	
	кожный	LD50 12800 mg/kg	кролик		
	ингаляционный (4 h) испарение	LC50 46,5 mg/l	крыса		

Раздражение и коррозия

Вызывает ожоги кожи и слизистой глаза.

Сенсибилизирующее действие

Может вызывать аллергическую кожную реакцию.

Канцерогенные, мутационные последствия, а также скорость их распространения

H351 - Предположительно вызывает рак.

Специфическая токсичность для отдельного органа-мишени при однократном воздействии

Вещество или смесь не относятся к классу специфических токсических веществ для органа-мишени, при единичном воздействии.

Специфическая токсичность для отдельного органа-мишени при многократном воздействии

H373 - Может наносить вред органам в результате длительного или многократного воздействия.

Опасно при вдыхании

Отсутствие классификации по токсичности при вдыхании

Специфические / особые симптомы в опытах с животными

Токсикологическая информация отсутствует.

Последующая информация Прочие наблюдения

Не известны.

Дальнейшие указания

Нельзя исключать наличие других опасных свойств. Обращаться в соответствии с правилами безопасности и промышленной гигиены.

РАЗДЕЛ 12: Информация о воздействии на окружающую среду
12.1. Токсичность

О самом продукте не имеется никаких данных.



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CAS-Номер	название	Доза		[h] [d]	Виды	Источник	Метод
57-55-6	1,2-пропандиол						
	Острая токсичность для рыб	LC50 mg/l	51600	96 h	Oncorhynchus mykiss (Радужная форель)	OECD 203	
	Острая Crustacea токсичность	EC50 mg/l	34400	48 h	Daphnia magna (дафния)	Информация на основе справочных работ и справочной литературы.	
5470-11-1	hydroxylammonium chloride; hydroxylamine hydrochloride						
	Острая токсичность для рыб	LC50 mg/l	1-10	96 h	Leuciscus idus (Золотой карп)		
67-63-0	2-пропанол						
	Острая токсичность для рыб	LC50 mg/l	1400	96 h	Lepomis macrochirus (Луна - рыба)		
	Острая водорослевая токсичность	ErC50 mg/l	> 1000	72 h	Pseudokirchneriella subcapitata (зеленые водоросли)	IUCLID	
	Острая Crustacea токсичность	EC50 mg/l	13299	48 h	Daphnia magna (дафния)	IUCLID	

12.2. Стойкость и разлагаемость

О самом продукте не имеется никаких данных.

12.3. Потенциал биоаккумуляции

О самом продукте не имеется никаких данных.

Коэффициент распределения (n-октанол/вода)

CAS-Номер	название	Log Pow
57-55-6	1,2-пропандиол	-0,92

12.4. Мобильность в почве

О самом продукте не имеется никаких данных.

12.5. Результаты оценки РВТ и vPvB

О самом продукте не имеется никаких данных.

12.6. Другие неблагоприятные воздействия

Необходимо избегать сброса материала в окружающую среду.

РАЗДЕЛ 13: Рекомендации по удалению отходов (остатков)

13.1. Методы утилизации отходов

Рекомендация

В соответствии с местными и государственными ограничениями.

Утилизация неочищенной упаковки и рекомендуемые средства очистки

Удалить в качестве неиспользованного продукта.

РАЗДЕЛ 14: Информация при перевозках (транспортировании)

Сухопутный транспорт (ADR/RID)

14.1. Номер ООН:

UN 2924



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14.2. Надлежащее отгрузочное наименование:

ЛЕГКОВОСПЛАМЕНЯЮЩАЯСЯ ЖИДКОСТЬ КОРРОЗИОННАЯ, Н.У.К. (<10% 2-пропанол, hydroxylammonium chloride; hydroxylamine hydrochloride)

14.3. Категория опасности при транспортировке:

3

14.4. Упаковочная группа:

III

Лист опасности:

3+8



Классификационный код:
Особо оговоренные условия:
Ограниченное количество (LQ):
Освобожденные количества:
Категория транспортировки:
Риск №:
Код ограничения проезда через туннели:

FC
274
5 L
E1
3
38
D/E

Морская доставка (IMDG)

14.1. Номер ООН:

UN 2924

14.2. Надлежащее отгрузочное наименование:

FLAMMABLE LIQUID, CORROSIVE, N.O.S. (10% Isopropanol-/hydroxylamine hydrochloride solution)

14.3. Категория опасности при транспортировке:

3

14.4. Упаковочная группа:

III

Лист опасности:

3+8



ЗАГРЯЗНИТЕЛЬ МОРСКОЙ СРЕДЫ:

--

Особо оговоренные условия:
Ограниченное количество (LQ):
Освобожденные количества:
EmS:

223, 274
5 L
E1
F-E, S-C

Воздушный транспорт (ICAO-TI/IATA-DGR)

14.1. Номер ООН:

UN 2924

14.2. Надлежащее отгрузочное наименование:

FLAMMABLE LIQUID, CORROSIVE, N.O.S. (10% Isopropanol-/hydroxylamine hydrochloride solution)

14.3. Категория опасности при транспортировке:

3

14.4. Упаковочная группа:

III

Лист опасности:

3+8



Особо оговоренные условия:
Ограниченное количество (LQ):
(Пассажирский самолет):

A3 A803
1 L



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Passenger LQ:	Y342	
Освобожденные количества:	E1	
Инструкция по упаковке (Пассажирский самолет):		354
Максимальное количество (Пассажирский самолет):		5 L
Инструкция по упаковке (Грузовой самолет):		365
Максимальное количество (Грузовой самолет):		60 L

14.5. Опасность вредного воздействия на окружающую среду

ОПАСНО ДЛЯ ОКРУЖАЮЩЕЙ СРЕДЫ: да



Источник опасности: hydroxylammonium chloride; hydroxylamine hydrochloride

14.6. Специальные меры предосторожности для пользователя

не имеются данные

14.7. Перевозка массовых грузов в соответствии с Приложением II МАРПОЛ 73/789 и Кодексом МКХ

Не относится

Другая дополнительная информация

Дополнительная информация: Этот продукт может быть отправлен в составе химического комплекта. И он содержит различные совместимые с опасными грузами для анализа или тестирования. Этот набор будет иметь следующую классификацию: UN3316 Химическая Kit, класс 9, группа упаковки II
Эти транспортные данные относятся ко всей стаи.

РАЗДЕЛ 15: Информация о национальном и международном законодательстве**15.1. Нормативы по охране и гигиене труда и природоохранительное законодательство/нормативы, характерные для данного вещества или смеси.****Национальные предписания**

Указания об ограничении деятельности:	Соблюдать ограничения трудовой деятельности, в соответствии с законом по охране труда молодежи (94/33/ЕС). Соблюдать ограничение трудовой деятельности для кормящих матерей или будущих мам, в соответствии с законом об охране материнства (92/85/ЕЭС).
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Класс загрязнения воды (D): 2 - опасен для воды

РАЗДЕЛ 16: Дополнительная информация**Редакционные примечания**

Редакция: 23.04.2018
Обновленные разделы паспорта безопасности: 8, 11, 15, 16
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Редакция: 06.11.2013



Паспорт безопасности

в соответствии с Регламентом (ЕС) № 1907/2006

425-32 Hardness 2 Solution

Дата ревизии: 23.04.2018

Код продукта: 42532

страница 11 из 11

Классификация смесей и использованный метод оценки согласно СГС

Классификация	Процедура классификации
Met. Corr. 1; H290	На основе данных испытаний
Flam. Liq. 3; H226	На основе данных испытаний
Skin Corr. 1; H314	На основе данных испытаний
Eye Dam. 1; H318	На основе данных испытаний
Skin Sens. 1; H317	Процесс расчета
Carc. 2; H351	Процесс расчета
STOT RE 2; H373	Процесс расчета

Текст H-фраз (Номер и полный текст)

H225	Легковоспламеняющаяся жидкость. Пары образуют с воздухом взрывоопасные смеси.
H226	Воспламеняющаяся жидкость. Пары образуют с воздухом взрывоопасные смеси.
H290	Может вызывать коррозию металлов.
H302	Вредно при проглатывании.
H312	Наносит вред при контакте с кожей.
H314	При попадании на кожу и в глаза вызывает химические ожоги.
H315	При попадании на кожу вызывает раздражение.
H317	При контакте с кожей может вызывать аллергическую реакцию.
H318	При попадании в глаза вызывает необратимые последствия.
H319	При попадании в глаза вызывает выраженное раздражение.
H335	Может вызывать раздражение верхних дыхательных путей.
H336	Может вызывать сонливость или головокружение.
H351	Предполагается, что данное вещество вызывает раковые заболевания.
H373	Может поражать органы в результате многократного или продолжительного воздействия.
H400	Чрезвычайно токсично для водных организмов.

Дополнительная информация

Данные базируются на сегодняшнем уровне наших знаний, однако они не представляют собой гарантию свойств продукта и не являются основой для договорных правовых связей.

(Данные по опасным ингредиентам были взяты из информационных листов по технике безопасности субподрядчиков в их последней актуальной редакции.)


КОПИЯ ВЕРНА

Директор К.А. Половников

Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code HI7006
Product name Buffer Solution pH 6.86

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use Calibration of pH Electrodes

1.3. Details of the supplier of the safety data sheet

Name Hanna Instruments S.R.L.
Full address str. Hanna Nr 1
District and Country 457260 loc. Nusfalau (Salaj)
Romania
Tel. +40 260607700
Fax +40 260607700
e-mail address of the competent person responsible for the Safety Data Sheet msds@hanna.ro

1.4. Emergency telephone number

For urgent inquiries refer to Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: -

2.2. Label elements

Hazard pictograms: -
Signal words: -
Hazard statements: -
Precautionary statements: -

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 4. First aid measures ... / >>

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available



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SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	liquid
Colour	colourless
Odour	odourless
Odour threshold	Not available
pH	6,8
Melting point / freezing point	Not available
Initial boiling point	Not available
Boiling range	Not available
Flash point	Not applicable
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Lower inflammability limit	Not available
Upper inflammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	1,00
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	not applicable
Oxidising properties	not applicable

9.2. Other information

Total solids (250°C / 482°F)	0,69 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.



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SECTION 10. Stability and reactivity ... / >>

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled according to good industrial practices.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:	Not classified (no significant component)
LD50 (Oral) of the mixture:	Not classified (no significant component)
LD50 (Dermal) of the mixture:	Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

SECTION 11. Toxicological information ... / >>

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable



SECTION 14. Transport information ... / >>

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH) ТехСнабжение
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 1: Low hazard to waters

15.2. Chemical safety assessment

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods



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SECTION 16. Other information ... / >>

- IMO: International Maritime Organization- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

01 / 03 / 06 / 09 / 11.



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КОПИЯ ВЕРНА

Директор К.А. Половников

Safety data sheet according to Regulation (EC) No. 1907/2006

SECTION 1. Identification of the substance/mixture and of the company/undertaking.

1.1. Product identifier.

Code. HI7001
 Product name. pH 1.68 Buffer Solution

1.2. Relevant identified uses of the substance or mixture and uses advised against.

Intended use. Calibration of pH Electrodes.

1.3. Details of the supplier of the safety data sheet.

Name. Hanna Instruments S.R.L.
 Full address. str. Hanna Nr 1
 District and Country. 457260 loc. Nusfalau (Salaj)
 Romania
 Tel. (+40) 260607700
 Fax. (+40) 260607700

e-mail address of the competent person.
 responsible for the Safety Data Sheet. msds@hanna.ro

1.4. Emergency telephone number.

For urgent inquiries refer to. Emergency Number - International: +(1)-703-527-3887 - UK, London:
 +(44)-870-8200418 - CHEMTREC 24 hours/365 days

SECTION 2. Hazards identification.

2.1. Classification of the substance or mixture.

The product is classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of EC Regulation 1907/2006 and subsequent amendments.

Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:
 Skin corrosion, category 1B H314 Causes severe skin burns and eye damage.

2.2. Label elements.

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: Danger

Hazard statements:
 H314 Causes severe skin burns and eye damage.

Precautionary statements:
 P280 Wear protective gloves, protective clothing, eye protection and face protection.
 P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water / shower.
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P310 Immediately call a POISON CENTER or doctor.

2.3. Other hazards.



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On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients.

3.1. Substances.

Information not relevant.

3.2. Mixtures.

Contains:

Identification.	x = Conc. %.	Classification 1272/2008 (CLP).
POTASSIUM TETRAOXALATE		
CAS. 6100-20-5	1 ≤ x < 5	Acute Tox. 4 H302, Acute Tox. 4 H312, Eye Irrit. 2 H319, Skin Irrit. 2 H315, Note A
EC. 204-874-6		
INDEX. 607-007-00-3		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures.

4.1. Description of first aid measures.

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.

SKIN: Remove contaminated clothing. Wash immediately with plenty of water. If irritation persists, get medical advice/attention. Wash contaminated clothing before using it again.

INHALATION: Remove to open air. In the event of breathing difficulties, get medical advice/attention immediately.

INGESTION: Get medical advice/attention. Induce vomiting only if indicated by the doctor. Never give anything by mouth to an unconscious person, unless authorised by a doctor.

4.2. Most important symptoms and effects, both acute and delayed.

Specific information on symptoms and effects caused by the product are unknown.

For symptoms and effects caused by the contained substances, see chap. 11.

POTASSIUM TETRAOXALATE

The following applies to oxalates in general: nausea and vomiting after swallowing. Mucosal irritations, coughing, and dyspnoea after inhalation. Systemic effect: drop in the blood calcium level, toxic effect on kidneys, cardiovascular disorders.

4.3. Indication of any immediate medical attention and special treatment needed.

Information not available.

SECTION 5. Firefighting measures.

5.1. Extinguishing media.

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture.

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters.

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).



SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures.

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions.

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up.

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections.

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling.

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use. Remove any contaminated clothes and personal protective equipment before entering places in which people eat.

7.2. Conditions for safe storage, including any incompatibilities.

Store only in the original container. Store the containers sealed, in a well ventilated place, away from direct sunlight. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s).

Information not available.

SECTION 8. Exposure controls/personal protection.

8.1. Control parameters.

POTASSIUM TETRAOXALATE

Predicted no-effect concentration - PNEC.

Normal value in fresh water	0,162	mg/l
Normal value in marine water	0,016	mg/l
Normal value for water, intermittent release	1,622	mg/l
Normal value of STP microorganisms	1550	mg/l

8.2. Exposure controls.

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration. Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category II professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type B filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.)

SECTION 8. Exposure controls/personal protection. ... / >>

combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS.

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties.

Appearance	liquid
Colour	colourless
Odour	odourless
Odour threshold.	Not available.
pH.	1,68
Melting point / freezing point.	Not available.
Initial boiling point.	Not available.
Boiling range.	Not available.
Flash point.	> 60 °C.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Lower inflammability limit.	Not available.
Upper inflammability limit.	Not available.
Lower explosive limit.	Not available.
Upper explosive limit.	Not available.
Vapour pressure.	Not available.
Vapour density	Not available.
Relative density.	1,000
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature.	Not available.
Decomposition temperature.	Not available.
Viscosity	Not available.
Explosive properties	Not available.
Oxidising properties	Not available.

9.2. Other information.

Total solids (250°C / 482°F)	1,26 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0



SECTION 10. Stability and reactivity.

10.1. Reactivity.

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability.

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions.

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid.

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials.

Information not available.

10.6. Hazardous decomposition products.

POTASSIUM TETRAOXALATE

When heated to decomposition it releases caustic potassium oxide fumes.



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SECTION 11. Toxicological information.

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.

It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects.

ACUTE TOXICITY.

LC50 (Inhalation - vapours) of the mixture:	Not classified (no significant component).
LC50 (Inhalation - mists / powders) of the mixture:	Not classified (no significant component).
LD50 (Oral) of the mixture:	10000,002 mg/kg
LD50 (Dermal) of the mixture:	22000,004 mg/kg

SKIN CORROSION / IRRITATION.

Corrosive for the skin.

SERIOUS EYE DAMAGE / IRRITATION.

Does not meet the classification criteria for this hazard class.

RESPIRATORY OR SKIN SENSITISATION.

Does not meet the classification criteria for this hazard class.

GERM CELL MUTAGENICITY.

Does not meet the classification criteria for this hazard class.

CARCINOGENICITY.

Does not meet the classification criteria for this hazard class.

REPRODUCTIVE TOXICITY.

Does not meet the classification criteria for this hazard class.

STOT - SINGLE EXPOSURE.

Does not meet the classification criteria for this hazard class.

STOT - REPEATED EXPOSURE.

Does not meet the classification criteria for this hazard class.

ASPIRATION HAZARD.

Does not meet the classification criteria for this hazard class.

SECTION 12. Ecological information.

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity.

POTASSIUM TETRAOXALATE	
EC50 - for Crustacea.	162,2 mg/l/48h Daphnia magna

12.2. Persistence and degradability.

POTASSIUM TETRAOXALATE	
Solubility in water.	25000 mg/l
Rapidly biodegradable.	

12.3. Bioaccumulative potential.

POTASSIUM TETRAOXALATE	
Partition coefficient: n-octanol/water.	-4,961



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 12. Ecological information. ... / >>

12.4. Mobility in soil.

Information not available.

12.5. Results of PBT and vPvB assessment.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects.

Information not available.

SECTION 13. Disposal considerations.

13.1. Waste treatment methods.

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information.

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number.

Not applicable.

14.2. UN proper shipping name.

Not applicable.

14.3. Transport hazard class(es).

Not applicable.

14.4. Packing group.

Not applicable.

14.5. Environmental hazards.

Not applicable.

14.6. Special precautions for user.

Not applicable.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code.

Information not relevant.

SECTION 15. Regulatory information.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

Seveso Category - Directive 2012/18/EC: _____

None.

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006. _____

Product Point.

3

Substances in Candidate List (Art. 59 REACH). _____

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.



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SECTION 15. Regulatory information. ... / >>

Substances subject to authorisation (Annex XIV REACH).

None.

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None.

Substances subject to the Rotterdam Convention:

None.

Substances subject to the Stockholm Convention:

None.

Healthcare controls.

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

WGK 0: Not hazardous to waters

15.2. Chemical safety assessment.

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information.

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Acute Tox. 4	Acute toxicity, category 4
Skin Corr. 1B	Skin corrosion, category 1B
Eye Irrit. 2	Eye irritation, category 2
Skin Irrit. 2	Skin irritation, category 2
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H319	Causes serious eye irritation.
H315	Causes skin irritation.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).



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SECTION 16. Other information. ... / >>

GENERAL BIBLIOGRAPHY

1. Regulation (EU) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:
13 / 14.

СтройТехСнабжение



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КОПИЯ ВЕРНА

Директор К.А. Половников 

Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code **HI7010**
Product name **pH 10.01 Buffer Solution**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Calibration of pH Electrodes.**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
Full address **str. Hanna Nr 1**
District and Country **457260 loc. Nusfalau (Salaj) Romania**
Tel. **+40 260607700**
Fax **+40 260607700**
e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: **-**

2.2. Label elements

Hazard pictograms: **--**
Signal words: **--**
Hazard statements: **--**
Precautionary statements: **--**

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.



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SECTION 4. First aid measures ... / >>

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available



SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	liquid
Colour	colourless
Odour	odourless
Odour threshold	Not available
pH	10
Melting point / freezing point	Not available
Initial boiling point	Not available
Boiling range	Not available
Flash point	Not applicable
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Lower inflammability limit	Not available
Upper inflammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	1,00
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	not applicable
Oxidising properties	not applicable

9.2. Other information

Total solids (250°C / 482°F)	0,47 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.



SECTION 10. Stability and reactivity ... / >>

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled according to good industrial practices.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

LD50 (Oral) of the mixture:

LD50 (Dermal) of the mixture:

Not classified (no significant component)

Not classified (no significant component)

Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

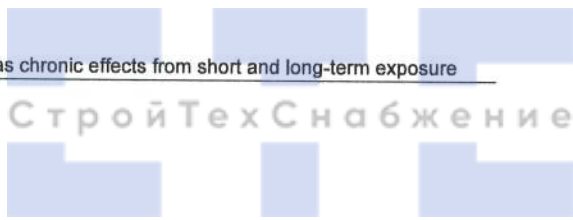
Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class



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SECTION 11. Toxicological information ... / >>

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable



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SECTION 14. Transport information ... / >>

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 1: Low hazard to waters

15.2. Chemical safety assessment

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods



SECTION 16. Other information ... / >>

- IMO: International Maritime Organization- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

01 / 03 / 06 / 09 / 11.



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КОПИЯ ВЕРНА

Директор К.А. Половников

Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier

Code **HI7007**
Product name **pH 7.01 Buffer Solution**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Calibration of pH Electrodes.**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
Full address **str. Hanna Nr 1**
District and Country **457260 loc. Nusfalau (Salaj)**
Romania
Tel. **+40 260607700**
Fax **+40 260607700**

e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: **-**

2.2. Label elements

Hazard pictograms: **--**
Signal words: **--**
Hazard statements: **--**
Precautionary statements: **--**

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.



SECTION 4. First aid measures ... / >>

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	liquid
Colour	colourless
Odour	odourless
Odour threshold	Not available
pH	7
Melting point / freezing point	Not available
Initial boiling point	Not available
Boiling range	Not available
Flash point	Not applicable
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Lower flammability limit	Not available
Upper flammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	1,00
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	not applicable
Oxidising properties	not applicable

9.2. Other information

Total solids (250°C / 482°F)	0,93 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.



SECTION 10. Stability and reactivity ... / >>

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled according to good industrial practices.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

Not classified (no significant component)

LD50 (Oral) of the mixture:

Not classified (no significant component)

LD50 (Dermal) of the mixture:

Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

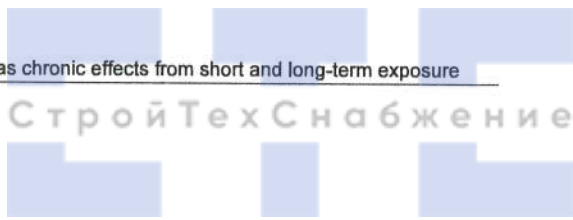
Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class



SECTION 11. Toxicological information ... / >>

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable



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SECTION 14. Transport information ... / >>

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH) ТехСнабжение
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 1: Low hazard to waters

15.2. Chemical safety assessment

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods



SECTION 16. Other information ... / >>

- IMO: International Maritime Organization- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)

- The Merck Index, - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

01 / 03 / 06 / 09 / 11.



Safety Data Sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code **HI7004**
 Product name **pH 4.01 Buffer Solution**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Calibration of pH Electrodes.**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
 Full address **str. Hanna Nr 1**
 District and Country **457260 loc. Nusfalau (Salaj) Romania**
 Tel. **+40 260607700**
 Fax **+40 260607700**
 e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: **-**

2.2. Label elements

Hazard pictograms: **-**
 Signal words: **-**
 Hazard statements: **-**
 Precautionary statements: **-**

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.



SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities



SECTION 7. Handling and storage ... / >>

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	liquid	
Colour	colourless	
Odour	odourless	
Odour threshold	Not available	
pH	4	
Melting point / freezing point	Not available	
Initial boiling point	Not available	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	175 mmHg	
Vapour density	Not available	
Relative density	1	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Total solids (250°C / 482°F)	1.01 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0



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КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled according to good industrial practices.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

Not classified (no significant component)

LD50 (Oral) of the mixture:

Not classified (no significant component)

LD50 (Dermal) of the mixture:

Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class



SECTION 11. Toxicological information ... / >>

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste. Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.



SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)

WGK 1: Low hazard to waters

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.



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Директор К.А. Половников

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)
16. Regulation (EU) 2019/521 (XII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current

SECTION 16. Other information ... / >>

health and safety laws and regulations. The producer is relieved from any liability arising from improper uses. Provide appointed staff with adequate training on how to use chemical products.

Product's classification is based on the calculation methods set out in Annex I of the CLP Regulation, unless otherwise indicated in sections 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified:

09 / 10 / 11 / 12 / 15.



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КОПИЯ ВЕРНА

Директор К.А. Подвизников 

HI7040-1 - Zero Oxygen Solution, Component I

Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code	HI7040-1
Product name	Zero Oxygen Solution, Component I
Chemical name and synonym	SODIUM METABISULFITE
INDEX number	016-063-00-2
EC number	231-673-0
CAS number	7681-57-4
Registration Number	01-2119531326-45

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	Calibration of Dissolved Oxygen Probes.
--------------	---

1.3. Details of the supplier of the safety data sheet

Name	Hanna Instruments S.R.L.	
Full address	str. Hanna Nr 1	
District and Country	457260 loc. Nusfalau	(Salaj)
	Romania	
	Tel. +40 260607700	
	Fax +40 260607700	
e-mail address of the competent person responsible for the Safety Data Sheet	msds@hanna.ro	

1.4. Emergency telephone number

For urgent inquiries refer to	Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days
-------------------------------	---

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2015/830.

Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Acute toxicity, category 4	H302	Harmful if swallowed.
Serious eye damage, category 1	H318	Causes serious eye damage.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: Danger

Hazard statements:

H302	Harmful if swallowed.
H318	Causes serious eye damage.
EUH031	Contact with acids liberates toxic gas.



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КОПИЯ ВЕРНА

Директор К.А. Половников

HI7040-1 - Zero Oxygen Solution, Component I

SECTION 2. Hazards identification ... / >>

Precautionary statements:

P280 Wear protective gloves / eye protection / face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor.

Contains: SODIUM METABISULFITE

INDEX 016-063-00-2

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.1. Substances

Contains:

Identification	Conc. %	Classification 1272/2008 (CLP)
SODIUM METABISULFITE		
CAS	7681-57-4 100	Acute Tox. 4 H302, Eye Dam. 1 H318, EUH031
EC	231-673-0	
INDEX	016-063-00-2	
Reg. no.	01-2119531326-45	

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.
SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention immediately. Wash contaminated clothing before using it again.
INHALATION: Remove to open air. If the subject stops breathing, administer artificial respiration. Get medical advice/attention immediately.
INGESTION: Get medical advice/attention immediately. Do not induce vomiting. Do not administer anything not explicitly authorised by a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Irritation and corrosion. Risk of serious damage to eyes.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products. The product is combustible and, when the powder is released into the air in sufficient concentrations and in the presence of a source of ignition, it can create explosive mixtures with air. Fires may start or get worse by leakage of the solid product from the container, when it reaches high temperatures or through contact with sources of ignition.



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HI7040-1 - Zero Oxygen Solution, Component I

SECTION 5. Firefighting measures ... / >>

Not combustible. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: Sulphur oxides.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

If there are no contraindications, spray powder with water to prevent the formation of dust. Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product and place it in containers for recovery or disposal. If there are no contraindications, use jets of water to eliminate product residues.

Make sure the leakage site is well aired. Evaluate the compatibility of the container to be used, by checking section 10. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed. Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

BEL	Belgique	AR du 11/3/2002. La liste est mise à jour pour 2017
DNK	Danmark	Bekendtgørelse om ændring af bekendtgørelse om grænseværdier for stoffer og materialer1- BEK nr 655 af 31/05/2018
ESP	España	LÍMITES DE EXPOSICIÓN PROFESIONAL PARA AGENTES QUÍMICOS EN ESPAÑA 2019 (INSST)
FRA	France	Valeurs limites d'exposition professionnelle aux agents chimiques en France. ED 984 - INRS
GBR	United Kingdom	EH40/2005 Workplace exposure limits (Third edition, published 2018)
GRC	Ελλάδα	ΕΦΗΜΕΡΙΔΑ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ - ΤΕΥΧΟΣ ΠΡΩΤΟ Αρ. Φύλλου 152 - 21 Αυγούστου 2018
HRV	Hrvatska	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima

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HI7040-1 - Zero Oxygen Solution, Component I

SECTION 8. Exposure controls/personal protection ... / >>

IRL	Éire	izloženosti i biološkim graničnim vrijednostima (NN 91/18)
NLD	Nederland	2018 Code of Practice for the Chemical Agents Regulations Safety Authority
		Regeling van de Staatssecretaris van Sociale Zaken en Werkgelegenheid van 13 juli 2018, 2018-0000118517 tot wijziging van de Arbeidsomstandighedenregeling in verband met de implementatie van Richtlijn 2017/164 in Bijlage XIII
NOR	Norge	Fastsatt av Arbeids- og sosialdepartementet 21. august 2018 med hjemmel i lov 17. juni 2005 nr. 62 om arbeidsmiljø, arbeidstid, stillingsvern mv. (arbeidsmiljøloven) § 1-3, § 1-4 og § 4-5
	TLV-ACGIH	ACGIH 2019

SODIUM METABISULFITE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
VLEP	BEL	5			
TLV	DNK	5			
VLA	ESP	5			
VLEP	FRA	5			
WEL	GBR	5			
TLV	GRC	5			
GVI/KGVI	HRV	5			
OEL	IRL	5			
TGG	NLD	5			
TLV	NOR	5			
TLV-ACGIH		5			

Predicted no-effect concentration - PNEC

Normal value in fresh water	1	mg/l
Normal value in marine water	0,1	mg/l
Normal value of STP microorganisms	75,4	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers				Effects on workers			
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral			VND	8,6 mg/kg bw/d				
Inhalation			VND	66 mg/m3			VND	225 mg/m3

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

During the risk assessment process, it is essential to take into consideration the ACGIH occupational exposure levels for inert particulate not otherwise classified (PNOC respirable fraction: 3 mg/m3; PNOC inhalable fraction: 10 mg/m3). For values above these limits, use a P type filter, whose class (1, 2 or 3) must be chosen according to the outcome of risk assessment.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

If the product may or must come into contact or react with acids, suitable technical and/or organisational measures should be taken to prevent the development of toxic and/or inflammable gases.

HAND PROTECTION

In the case of prolonged contact with the product, protect the hands with penetration-resistant work gloves (see standard EN 374).

Work glove material must be chosen according to the use process and the products that may form. Latex gloves may cause sensitivity reactions.

SKIN PROTECTION

Wear category I professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

In the presence of risks of exposure to splashes or squirts during work, adequate mouth, nose and eye protection should be used to prevent accidental absorption.

RESPIRATORY PROTECTION

Use a type P filtering facemask, whose class (1, 2 or 3) and effective need, must be defined according to the outcome of risk assessment (see standard EN 149).

ENVIRONMENTAL EXPOSURE CONTROLS



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The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	solid powder	
Colour	white	
Odour	pungent	
Odour threshold	Not available	
pH	4 - 4.5 pH, 17 g/L	
Melting point / freezing point	Not available	
Initial boiling point	Not available	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	1,48	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Molecular weight	190,100
Total solids (250°C / 482°F)	100,00 %

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

The powders are potentially explosive when mixed with air.

Generates dangerous gases or fumes in contact with: acids. Exothermic reaction with: Oxidizing agents, nitrites, nitrates, Sulphides.

10.4. Conditions to avoid

Avoid environmental dust build-up.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available



КОПИЯ ВЕРНА
Директор К.А. Полюшников

HI7040-1 - Zero Oxygen Solution, Component I

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Eye irritation, Rabbit, Result: Eye irritation, Causes serious eye damage.

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

SODIUM METABISULFITE
LD50 (Oral)
LD50 (Dermal)

1540 mg/kg Rat
> 2000 mg/kg Rat

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye damage

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class



КОПИЯ ВЕРНА

Директор К.А. Подвизников

HI7040-1 - Zero Oxygen Solution, Component I

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

SODIUM METABISULFITE	
EC50 - for Crustacea	89 mg/l/48h Daphnia magna
EC50 - for Algae / Aquatic Plants	48 mg/l/72h Desmodesmus subspicatus

12.2. Persistence and degradability

SODIUM METABISULFITE	
Solubility in water	> 10000 mg/l
Degradability: information not available	

12.3. Bioaccumulative potential

SODIUM METABISULFITE	
Partition coefficient: n-octanol/water	-3,7 Log Kow

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable



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HI7040-1 - Zero Oxygen Solution, Component I**SECTION 14. Transport information** ... / >>**14.5. Environmental hazards**

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**Seveso Category - Directive 2012/18/EC: NoneRestrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006

None

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)

WGK 1: Low hazard to waters

Self assessment based on Annex 3

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Acute Tox. 4	Acute toxicity, category 4
Eye Dam. 1	Serious eye damage, category 1
H302	Harmful if swallowed.
H318	Causes serious eye damage.
EUH031	Contact with acids liberates toxic gas.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%



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SECTION 16. Other information ... / >>

- IMDG: International Maritime Code for dangerous goods- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)
16. Regulation (EU) 2019/521 (XII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Product's classification is based on the calculation methods set out in Annex I of the CLP Regulation, unless otherwise indicated in sections 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified:

01 / 03 / 05 / 08 / 09 / 15.



КОПИЯ ВЕРНА

Директор К.А. Половников

Safety Data Sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code	HI7040-2
Product name	Zero Oxygen Solution, Component II
Chemical name and synonym	WATER
EC number	231-791-2
CAS number	7732-18-5

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	Calibration of Dissolved Oxygen Probes.
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1.3. Details of the supplier of the safety data sheet

Name	Hanna Instruments S.R.L.	
Full address	str. Hanna Nr 1	
District and Country	457260 loc. Nusfalau	(Salaj)
	Romania	
	Tel. +40 260607700	
	Fax +40 260607700	
e-mail address of the competent person responsible for the Safety Data Sheet	msds@hanna.ro	

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: —

2.2. Label elements

Hazard pictograms:	—
Signal words:	—
Hazard statements:	—
Precautionary statements:	—

This product is not subject to hazard labeling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.1. Substances

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.



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Директор К.А. Половников



SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

4.2. Most important symptoms and effects, both acute and delayed

No episodes of damage to health ascribable to the product have been reported.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities



SECTION 7. Handling and storage ... / >>

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	liquid	
Colour	colourless	
Odour	odourless	
Odour threshold	Not available	
pH	7	
Melting point / freezing point	Not available	
Initial boiling point	100 °C	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	1	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Molecular weight	18.000
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0



КОПИЯ ВЕРНА
Директор К.А. Половников

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

Does not meet the classification criteria for this hazard class

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY



SECTION 11. Toxicological information ... / >>

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number



SECTION 14. Transport information ... / >>

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
 None

Substances in Candidate List (Art. 59 REACH)
 On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
 None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
 None

Substances subject to the Rotterdam Convention:
 None

Substances subject to the Stockholm Convention:
 None

Healthcare controls
 Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
 WGK Nwg: Not hazardous to waters
 Substance listed in Annex 2

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 16. Other information ... / >>

- IC50: Immobilization Concentration 50% - IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)
16. Regulation (EU) 2019/521 (XII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Product's classification is based on the calculation methods set out in Annex I of the CLP Regulation, unless otherwise indicated in sections 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified:

09.



Safety Data Sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code	A ZERO
Product name	Cal Check Cuvette - Zero
Chemical name and synonym	WATER
EC number	231-791-2
CAS number	7732-18-5

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	Validation and Calibration of Hanna 96 Series Portable Photometers.
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1.3. Details of the supplier of the safety data sheet

Name	Hanna Instruments S.R.L.
Full address	str. Hanna Nr 1
District and Country	457260 loc. Nusfalau (Salaj) Romania
Tel.	+40 260607700
Fax	+40 260607700
e-mail address of the competent person responsible for the Safety Data Sheet	msds@hanna.ro

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: -

2.2. Label elements

Hazard pictograms: -
 Signal words: -
 Hazard statements: -
 Precautionary statements: -

This product is not subject to hazard labeling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.1. Substances

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.



КОПИЯ ВЕРНА

Директор К.А. Поповникова

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

4.2. Most important symptoms and effects, both acute and delayed

No episodes of damage to health ascribable to the product have been reported.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities



SECTION 7. Handling and storage ... / >>

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	liquid	
Colour	colourless	
Odour	odourless	
Odour threshold	Not available	
pH	7	
Melting point / freezing point	Not available	
Initial boiling point	100 °C	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	1	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Molecular weight	18,000
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

Does not meet the classification criteria for this hazard class

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 11. Toxicological information ... / >>

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste. Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
 Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number



КОПИЯ ВЕРНА

Директор К.А. Половников 

SECTION 14. Transport information ... / >>

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
 None

Substances in Candidate List (Art. 59 REACH)
 On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
 None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
 None

Substances subject to the Rotterdam Convention:
 None

Substances subject to the Stockholm Convention:
 None

Healthcare controls
 Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
 WGK Nwg: Not hazardous to waters
 Substance listed in Annex 2

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
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SECTION 16. Other information ... / >>

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- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
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- IFA GESTIS website
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- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

01 / 09 / 15.



КОПИЯ ВЕРНА

Директор К.А. Половников

HI96721B - Cal Check® Standard Cuvette B

Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code **HI96721B**
Product name **Cal Check® Standard Cuvette B**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Validation and Calibration of Hanna Portable Photometers that Measure HR Iron.**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
Full address **str. Hanna Nr 1**
District and Country **457260 loc. Nusfalau (Salaj) Romania**
Tel. **+40 260607700**
Fax **+40 260607700**
e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2015/830.

Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Substance or mixture corrosive to metals, category 1	H290	May be corrosive to metals.
Carcinogenicity, category 1B	H350i	May cause cancer by inhalation.
Germ cell mutagenicity, category 2	H341	Suspected of causing genetic defects.
Reproductive toxicity, category 1B	H360F	May damage fertility.
Skin corrosion, category 1C	H314	Causes severe skin burns and eye damage.
Respiratory sensitization, category 1B	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitization, category 1A	H317	May cause an allergic skin reaction.
Hazardous to the aquatic environment, chronic toxicity, category 2	H411	Toxic to aquatic life with long lasting effects.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: **Danger**



КОПИЯ ВЕРНА
Директор К.А. Половников

HI96721B - Cal Check® Standard Cuvette B

SECTION 2. Hazards identification ... / >>

Hazard statements:

H290	May be corrosive to metals.
H350I	May cause cancer by inhalation.
H341	Suspected of causing genetic defects.
H360F	May damage fertility.
H314	Causes severe skin burns and eye damage.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H411	Toxic to aquatic life with long lasting effects.
EUH208	Contains: COBALT (II) CHLORIDE HEXAHYDRATE May produce an allergic reaction.

Restricted to professional users.

Precautionary statements:

P201	Obtain special instructions before use.
P260	Do not breathe dust, fume, gas, mist, vapours, spray.
P280	Wear protective gloves / protective clothing / eye protection / face protection.
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice / attention.

Contains: COBALT (II) CHLORIDE HEXAHYDRATE

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Contains:

Identification x = Conc. % Classification 1272/2008 (CLP)

COBALT (II) CHLORIDE HEXAHYDRATE

24,79% - metallic element

CAS 7791-13-1 1 ≤ x < 2,5

Carc. 1B H350I, Muta. 2 H341, Repr. 1B H360F, Acute Tox. 4 H302, Resp. Sens. 1B H334, Skin Sens. 1A H317, Aquatic Acute 1 H400 M=10, Aquatic Chronic 1 H410 M=10, Classification note according to Annex VI to the CLP Regulation: 1

EC 231-589-4

INDEX 027-004-00-5

HYDROCHLORIC ACID

CAS 7647-01-0 1 ≤ x < 5

Met. Corr. 1 H290, Skin Corr. 1B H314, Eye Dam. 1 H318, STOT SE 3 H335, Classification note according to Annex VI to the CLP Regulation: B

EC 231-595-7

INDEX 017-002-01-X

Reg. no. 01-2119484862-26

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

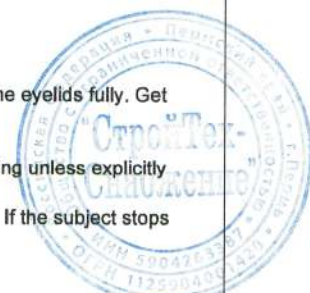
4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 30-60 minutes, opening the eyelids fully. Get medical advice/attention.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention.

INGESTION: Have the subject drink as much water as possible. Get medical advice/attention. Do not induce vomiting unless explicitly authorised by a doctor.

INHALATION: Get medical advice/attention immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.



КОПИЯ ВЕРНА

©EPY 9.11.0 - SDS 1004.13

Директор К.А. Половников

HI96721B - Cal Check® Standard Cuvette B**SECTION 4. First aid measures ... / >>****4.2. Most important symptoms and effects, both acute and delayed**

Specific information on symptoms and effects caused by the product are unknown.

COBALT (II) CHLORIDE HEXAHYDRATE

Allergic reactions, irritant effects, Diarrhoea, Tremors, Symptoms of an acute cobalt intoxication: diarrhoea, loss of appetite, drop in body temperature, drop in blood pressure. Toxic effect on kidneys (proteinuria, anuria), heart, and pancreas.

HYDROCHLORIC ACID

HYDROCHLORIC ACID 37%: Irritation and corrosion, Cough, Shortness of breath, cardiovascular disorders, Risk of blindness!

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures**5.1. Extinguishing media****SUITABLE EXTINGUISHING EQUIPMENT**

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture**HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE**

Do not breathe combustion products.

HYDROCHLORIC ACID

HYDROCHLORIC ACID 37%: Not combustible. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: Hydrogen chloride gas.

5.3. Advice for firefighters**GENERAL INFORMATION**

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.



HI96721B - Cal Check® Standard Cuvette B**SECTION 7. Handling and storage****7.1. Precautions for safe handling**

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed. Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

Storage class TRGS 510 (Germany): 6.1C

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection**8.1. Control parameters**

Regulatory References:

AUS	Österreich	Gesamte Rechtsvorschrift für Grenzwerteverordnung 2018, Fassung vom 17.10.2018
BEL	Belgique	AR du 11/3/2002. La liste est mise à jour pour 2017
CHE	Suisse / Schweiz	Valeurs limites d'exposition aux postes de travail en Suisse: valeurs VME/VLE. Version Mars 2018 (SUVA)
DEU	Deutschland	TRGS 900 - Seite 1 von 69 (Fassung 29.03.2019)- Liste der Arbeitsplatzgrenzwerte und Kurzzeitwerte
DNK	Danmark	Bekendtgørelse om ændring af bekendtgørelse om grænseværdier for stoffer og materialer1- BEK nr 655 af 31/05/2018
ESP	España	LÍMITES DE EXPOSICIÓN PROFESIONAL PARA AGENTES QUÍMICOS EN ESPAÑA 2019 (INSST)
FIN	Suomi	HTP-VÄRDEN 2018. Koncentrationer som befunnits skadliga. SOCIAL- OCH HÄLSOVÄRDSMINISTERIETS PUBLIKATIONER 10/2018
GBR	United Kingdom	EH40/2005 Workplace exposure limits (Third edition,published 2018)
HUN	Magyarország	A pénzügyminiszter 7/2018. (VIII. 29.) PM rendelete a munkahelyek kémiai biztonságáról szóló 25/2000. (IX. 30.) EüM–SZCSM együttes rendelet módosításáról
IRL	Éire	2018 Code of Practice for the Chemical Agents Regulations Safety Authority
ITA	Italia	DIRETTIVA (UE) 2017/164 DELLA COMMISSIONE del 31 gennaio 2017
POL	Polska	ROZPORZĄDZENIE MINISTRA RODZINY, PRACY I POLITYKI SPOŁECZNEJ z dnia 12 czerwca 2018 r
ROU	România	HOTĂRÂRE nr. 584 din 2 august 2018 pentru modificarea Hotărârii Guvernului nr. 1.218/2006 privind stabilirea cerințelor minime de securitate și sănătate în muncă pentru asigurarea protecției lucrătorilor împotriva riscurilor legate de prezența agenților chimici
SWE	Sverige	Hygieniska gränsvärden, AFS 2018:1
EU	OEL EU	Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2019



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SECTION 8. Exposure controls/personal protection ... / >>

COBALT (II) CHLORIDE HEXAHYDRATE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		
		mg/m3	ppm	mg/m3	ppm	
MAK	AUS	0,1				
VLEP	BEL	0,02				
MAK	CHE	0,05				INHAL
TLV	DNK	0,01				
VLA	ESP	0,02				
HTP	FIN	0,02				
WEL	GBR	0,1				
OEL	IRL	0,1				
NDS/NDSCh	POL	0,02				
TLV	ROU	0,05				
NGV/KGV	SWE	0,02				
TLV-ACGIH		0,02				

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,0006	mg/l
Normal value in marine water	0,00236	mg/l
Normal value for fresh water sediment	9,5	mg/kg/d
Normal value for marine water sediment	9,5	mg/kg/d
Normal value of STP microorganisms	0,37	mg/l
Normal value for the terrestrial compartment	10,9	mg/kg/d

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers				Effects on workers			
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral			VND	0,12 mg/kg bw/d				
Inhalation			0,014 mg/m3	VND			0,088 mg/m3	VND

HYDROCHLORIC ACID

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		
		mg/m3	ppm	mg/m3	ppm	
MAK	AUS	8	5	15	10	
VLEP	BEL	8	5	15	10	
MAK	CHE	3	2	6	4	
MAK	DEU	3	2			
TLV	DNK	7	5	7	5	
VLA	ESP	7,6	5	15	10	
WEL	GBR	2	1	8	5	gas and aerosol mists
AK	HUN	8		16		
VLEP	ITA	8	5	15	10	
NDS/NDSCh	POL	5				
TLV	ROU	8	5	15	10	
OEL	EU	8	5	15	10	
TLV-ACGIH						2 (C)

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,036	mg/l
Normal value in marine water	0,036	mg/l
Normal value for water, intermittent release	0,045	mg/l
Normal value of STP microorganisms	0,036	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers				Effects on workers			
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation					15 mg/m3	VND	8 mg/m3	VND

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

COBALT (II) CHLORIDE HEXAHYDRATE

Co - Methods for measurement of the workplace atmosphere have to correspond to the requirements of norm ISO 15202 - Biological Values, ACGIH: 15 µg/L Cobalt in urine (End of shift at end of workweek), DEU: 15 µg/L Cobaltin Urin, Luft Cobalt 0.025 mg/Kubikmeter

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SECTION 8. Exposure controls/personal protection ... / >>

(Expositionsende bzw. Schichtende; bei Langzeitexposition: nach mehreren vorangegangenen Schichten), ESP: 15 µg/L Cobalto en orina (Final de la semana laboral).

HYDROCHLORIC ACID

Methods for measurement of the workplace atmosphere have to correspond to the requirements of norm NIOSH 7903.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

The product must be used inside a closed circuit, in a well-ventilated environment and with strong localised aspiration systems in place.

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category II professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type B filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

Product residues must not be indiscriminately disposed of with waste water or by dumping in waterways.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	liquid	
Colour	red	
Odour	odourless	
Odour threshold	Not available	
pH	0,5	
Melting point / freezing point	Not available	
Initial boiling point	Not available	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	1	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	



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SECTION 9. Physical and chemical properties ... / >>

Explosive properties not applicable
Oxidising properties not applicable

9.2. Other information

Total solids (250°C / 482°F) 2,39 %
VOC (Directive 2010/75/EC) : 0
VOC (volatile carbon) : 0

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

HYDROCHLORIC ACID
HYDROCHLORIC ACID 37%: Corrosive in contact with metals.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

COBALT (II) CHLORIDE HEXAHYDRATE
Risk of explosion with: Alkali metals.

HYDROCHLORIC ACID
HYDROCHLORIC ACID 37%: Exothermic reaction with: Amines, potassium permanganate, salts of oxyhalogenic acids, semimetallic oxides, semimetallic hydrogen compounds, Aldehydes, vinylmethyl ether, Risk of ignition or formation of inflammable gases or vapours with: carbides, lithium silicide, Fluorine. Generates dangerous gases or fumes in contact with: Aluminium, hydrides, formaldehyde, Metals, strong alkalis, Sulphides. Risk of explosion with: Alkali metals, conc. sulfuric acid.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

HYDROCHLORIC ACID
HYDROCHLORIC ACID 37%: Alkalis, organic substances, strong oxidants and metals.

10.6. Hazardous decomposition products

HYDROCHLORIC ACID
HYDROCHLORIC ACID 37%: Above decomposition temperature hydrochloric acid fumes may develop.

SECTION 11. Toxicological information

11.1. Information on toxicological effects

COBALT (II) CHLORIDE HEXAHYDRATE
Acute oral toxicity, absorption, Symptoms: Tremors, Diarrhoea - Acute inhalation toxicity, absorption, Symptoms: Irritation symptoms in the respiratory tract - Acute dermal toxicity, absorption, Skin irritation, Possible damages: slight irritation - Eye irritation, Possible damages: slight irritation - Sensitisation, May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction - CMR effects, Carcinogenicity: May cause cancer by inhalation - Mutagenicity: Suspected of causing genetic defects. Reproductive toxicity: May damage fertility.

HYDROCHLORIC ACID
HYDROCHLORIC ACID 37% - Mixture - Acute oral toxicity, Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach - Acute inhalation toxicity, Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages: damage of respiratory tract - Skin irritation, Mixture causes burns. - Eye irritation, Mixture causes serious eye damage. Risk of blindness! - Specific target organ toxicity, single exposure, Target Organs: Respiratory system, Mixture may cause respiratory irritation.

Metabolism, toxicokinetics, mechanism of action and other information



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SECTION 11. Toxicological information ... / >>

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:	Not classified (no significant component)
LD50 (Oral) of the mixture:	Not classified (no significant component)
LD50 (Dermal) of the mixture:	Not classified (no significant component)

HYDROCHLORIC ACID

LC50 (Inhalation)

4,74 mg/l/1h Rat

COBALT (II) CHLORIDE HEXAHYDRATE

LD50 (Oral)

766 mg/kg Rat

SKIN CORROSION / IRRITATION

Corrosive for the skin

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Sensitising for the skin

Sensitising for the respiratory system

May produce an allergic reaction.

Contains:

COBALT (II) CHLORIDE HEXAHYDRATE

GERM CELL MUTAGENICITY

Suspected of causing genetic defects

CARCINOGENICITY

May cause cancer

REPRODUCTIVE TOXICITY

May damage fertility

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class



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HI96721B - Cal Check® Standard Cuvette B**SECTION 12. Ecological information**

This product is dangerous for the environment and is toxic for aquatic organisms. In the long term, it have negative effects on acquatic environment.

12.1. Toxicity

HYDROCHLORIC ACID	
LC50 - for Fish	282 mg/l/96h
EC50 - for Crustacea	5E-05 mg/l/48h
COBALT (II) CHLORIDE HEXAHYDRATE	
LC50 - for Fish	1,512 mg/l/96h Oncorhynchus mykiss
EC50 - for Crustacea	6,8 mg/l/48h Ceriodaphnia dubia
EC10 for Algae / Aquatic Plants	0,023 mg/l/72h Pseudokirchnerella subcapitata
Chronic NOEC for Fish	0,739 mg/l Pimephales promelas

12.2. Persistence and degradability

HYDROCHLORIC ACID
Solubility in water > 10000 mg/l
Degradability: information not available

COBALT (II) CHLORIDE HEXAHYDRATE
Solubility in water > 10000 mg/l
Degradability: information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

HYDROCHLORIC ACID
HYDROCHLORIC ACID 37%: Forms corrosive mixtures with water even if diluted. Harmful effect due to pH shift. Discharge into the environment must be avoided.

SECTION 13. Disposal considerations**13.1. Waste treatment methods**

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

Waste transportation may be subject to ADR restrictions.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information**14.1. UN number**

ADR / RID, IMDG, IATA: 3264



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SECTION 14. Transport information ... / >>

14.2. UN proper shipping name

ADR / RID: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROCHLORIC ACID MIXTURE)
 IMDG: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROCHLORIC ACID MIXTURE)
 IATA: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROCHLORIC ACID MIXTURE)

14.3. Transport hazard class(es)

ADR / RID: Class: 8 Label: 8



IMDG: Class: 8 Label: 8



IATA: Class: 8 Label: 8



14.4. Packing group

ADR / RID, IMDG, IATA: III

14.5. Environmental hazards

ADR / RID: NO
 IMDG: NO
 IATA: NO

14.6. Special precautions for user

ADR / RID:	HIN - Kemler: 80 Special Provision: -	Limited Quantities: 5 L	Tunnel restriction code: (E)
IMDG:	EMS: F-A, S-B	Limited Quantities: 5 L	
IATA:	Cargo: Pass.: Special Instructions:	Maximum quantity: 60 L Maximum quantity: 5 L A3, A803	Packaging instructions: 856 Packaging instructions: 852

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: E2

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006

Product	
Point	3
Contained substance	
Point	28-30 COBALT (II) CHLORIDE HEXAHYDRATE

Substances in Candidate List (Art. 59 REACH)
 COBALT (II) CHLORIDE HEXAHYDRATE

Substances subject to authorisation (Annex XIV REACH)
 None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
 None

Substances subject to the Rotterdam Convention:
 None



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HI96721B - Cal Check® Standard Cuvette B**SECTION 15. Regulatory information ... / >>**

Substances subject to the Stockholm Convention:
None

Healthcare controls

Workers exposed to this health-dangerous chemical agent must undergo sanitary checks carried out in compliance with 2004/37/EC directive.

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 3: Severe hazard to waters

15.2. Chemical safety assessment

A chemical safety assessment has been performed for the following contained substances
HYDROCHLORIC ACID

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Carc. 1B	Carcinogenicity, category 1B
Muta. 2	Germ cell mutagenicity, category 2
Repr. 1B	Reproductive toxicity, category 1B
Acute Tox. 4	Acute toxicity, category 4
Skin Corr. 1B	Skin corrosion, category 1B
Skin Corr. 1C	Skin corrosion, category 1C
STOT SE 3	Specific target organ toxicity - single exposure, category 3
Resp. Sens. 1B	Respiratory sensitization, category 1B
Skin Sens. 1A	Skin sensitization, category 1A
Aquatic Acute 1	Hazardous to the aquatic environment, acute toxicity, category 1
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic toxicity, category 1
Aquatic Chronic 2	Hazardous to the aquatic environment, chronic toxicity, category 2
H290	May be corrosive to metals.
H350I	May cause cancer by inhalation.
H341	Suspected of causing genetic defects.
H360F	May damage fertility.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value



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SECTION 16. Other information ... / >>

- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)
16. Regulation (EU) 2019/521 (XII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

СтройТехСнабжение

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Product's classification is based on the calculation methods set out in Annex I of the CLP Regulation, unless otherwise indicated in sections 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified:

01 / 02 / 03 / 04 / 05 / 09 / 10 / 11 / 12 / 14 / 15.

Changes to previous review:

The following sections were modified:

08 / 16.



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Safety Data Sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code	A ZERO
Product name	Cal Check Cuvette - Zero
Chemical name and synonym	WATER
EC number	231-791-2
CAS number	7732-18-5

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	Validation and Calibration of Hanna 96 Series Portable Photometers.
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1.3. Details of the supplier of the safety data sheet

Name	Hanna Instruments S.R.L.
Full address	str. Hanna Nr 1
District and Country	457260 loc. Nufalau (Salaj) Romania
Tel.	+40 260607700
Fax	+40 260607700

e-mail address of the competent person responsible for the Safety Data Sheet

msds@hanna.ro

1.4. Emergency telephone number

For urgent inquiries refer to

Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: --

2.2. Label elements

Hazard pictograms: --

Signal words: --

Hazard statements: --

Precautionary statements: --

This product is not subject to hazard labeling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.1. Substances

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.



SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

4.2. Most important symptoms and effects, both acute and delayed

No episodes of damage to health ascribable to the product have been reported.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities



SECTION 7. Handling and storage ... / >>

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	liquid	
Colour	colourless	
Odour	odourless	
Odour threshold	Not available	
pH	7	
Melting point / freezing point	Not available	
Initial boiling point	100 °C	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	1	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Molecular weight	18,000
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0



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SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

Does not meet the classification criteria for this hazard class

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY



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SECTION 11. Toxicological information ... / >>

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste. Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number



SECTION 14. Transport information ... / >>

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
 None

Substances in Candidate List (Art. 59 REACH)
 On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
 None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
 None

Substances subject to the Rotterdam Convention:
 None

Substances subject to the Stockholm Convention:
 None

Healthcare controls
 Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
 WGK Nwg: Not hazardous to waters
 Substance listed in Annex 2

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation



SECTION 16. Other information ... / >>

- IC50: Immobilization Concentration 50% - IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

01 / 09 / 15.



Safety data sheet according to Regulation (EC) No. 1907/2006

SECTION 1. Identification of the substance/mixture and of the company/undertaking.

1.1. Product Identifier.

Code. **HI96717B**
 Product name. **Cal Check® Standard Cuvette B**

1.2. Relevant identified uses of the substance or mixture and uses advised against.

Intended use. **Validation and Calibration of Hanna Portable Photometers that Measure HR Phosphate.**

1.3. Details of the supplier of the safety data sheet.

Name. **Hanna Instruments S.R.L.**
 Full address. **str. Hanna Nr 1**
 District and Country. **457260 loc. Nusfalau (Salaj) Romania**
 Tel. **(+40) 260607700**
 Fax. **(+40) 260607700**
 e-mail address of the competent person responsible for the Safety Data Sheet. **msds@hanna.ro**

1.4. Emergency telephone number.

For urgent inquiries refer to. **Emergency Number - International: +(1)-703-527-3887 - UK, London: +(44)-870-8200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture.

The product is classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of EC Regulation 1907/2006 and subsequent amendments.

Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Substance or mixture corrosive to metals, category 1	H290	May be corrosive to metals.
Carcinogenicity, category 1B	H350i	May cause cancer by inhalation.
Germ cell mutagenicity, category 2	H341	Suspected of causing genetic defects.
Reproductive toxicity, category 1B	H360F	May damage fertility.
Skin corrosion, category 1B	H314	Causes severe skin burns and eye damage.
Eye irritation, category 2	H319	Causes serious eye irritation.
Respiratory sensitization, category 1	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitization, category 1	H317	May cause an allergic skin reaction.
Hazardous to the aquatic environment, chronic toxicity, category 2	H411	Toxic to aquatic life with long lasting effects.

2.2. Label elements.

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: **Danger**



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SECTION 2. Hazards identification. ... / >>

Hazard statements:

H290	May be corrosive to metals.
H350i	May cause cancer by inhalation.
H341	Suspected of causing genetic defects.
H360F	May damage fertility.
H314	Causes severe skin burns and eye damage.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H411	Toxic to aquatic life with long lasting effects. Restricted to professional users.

Precautionary statements:

P201	Obtain special instructions before use.
P260	Do not breathe dust, fume, gas, mist, vapours, spray.
P273	Avoid release to the environment.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water / shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice / attention.
P333+P313	If skin irritation or rash occurs: Get medical advice / attention.
P342+P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor.
P391	Collect spillage.

Contains: COBALT (II) CHLORIDE HEXAHYDRATE
 HYDROCHLORIC ACID

2.3. Other hazards.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients.

3.1. Substances.

Information not relevant.

3.2. Mixtures.

Contains:

Identification. x = Conc. %. **Classification 1272/2008 (CLP).**

COBALT (II) CHLORIDE HEXAHYDRATE

24,79% - metallic element

CAS. 7791-13-1 1 ≤ x < 2,5

Carc. 1B H350i, Muta. 2 H341, Repr. 1B H360F, Acute Tox. 4 H302, Acute Tox. 4 H332, Eye Dam. 1 H318, Resp. Sens. 1 H334, Skin Sens. 1 H317, Aquatic Acute 1 H400 M=10, Aquatic Chronic 1 H410 M=10, Note 1

EC. 231-589-4

INDEX. 027-004-00-5

HYDROCHLORIC ACID

CAS. 7647-01-0 1 ≤ x < 3

Met. Corr. 1 H290, Skin Corr. 1B H314, STOT SE 3 H335, Note B

EC. 231-595-7

INDEX. 017-002-01-X

Reg. no. 01-2119484862-26

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures.

4.1. Description of first aid measures.

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 30-60 minutes, opening the eyelids fully.

Get medical advice/attention.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention.



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SECTION 4. First aid measures. ... / >>

INGESTION: Have the subject drink as much water as possible. Get medical advice/attention. Do not induce vomiting unless explicitly authorised by a doctor.

INHALATION: Get medical advice/attention immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.

4.2. Most important symptoms and effects, both acute and delayed.

Specific information on symptoms and effects caused by the product are unknown.

For symptoms and effects caused by the contained substances, see chap. 11.

HYDROCHLORIC ACID

HYDROCHLORIC ACID 37%: Irritation and corrosion, Cough, Shortness of breath, cardiovascular disorders, Risk of blindness!.

COBALT (II) CHLORIDE HEXAHYDRATE

Allergic reactions, irritant effects, Diarrhoea, Tremors, Symptoms of an acute cobalt intoxication: diarrhoea, loss of appetite, drop in body temperature, drop in blood pressure. Toxic effect on kidneys (proteinuria, anuria), heart, and pancreas.

4.3. Indication of any immediate medical attention and special treatment needed.

Information not available.

SECTION 5. Firefighting measures.

5.1. Extinguishing media.

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture.

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

HYDROCHLORIC ACID

HYDROCHLORIC ACID 37%: Not combustible. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: Hydrogen chloride gas.

5.3. Advice for firefighters.

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures.

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions.

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up.

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections.

Any information on personal protection and disposal is given in sections 8 and 13.



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SECTION 7. Handling and storage.

7.1. Precautions for safe handling.

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities.

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed. Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

Storage class TRGS 510 (Germany): 6.1C

7.3. Specific end use(s).

Information not available.

SECTION 8. Exposure controls/personal protection.

8.1. Control parameters.

Regulatory References:

DEU	Deutschland	MAK-und BAT-Werte-Liste 2012
ESP	España	INSHT - Límites de exposición profesional para agentes químicos en España 2015
GBR	United Kingdom	EH40/2005 Workplace exposure limits
HUN	Magyarország	50/2011. (XII. 22.) NGM rendelet a munkahelyek kémiai biztonságáról
ITA	Italia	Decreto Legislativo 9 Aprile 2008, n.81
NLD	Nederland	Databank of the social and Economic Council of Netherlands (SER) Values, AF 2011:18
ROU	România	Monitorul Oficial al României 44; 2012-01-19
EU	OEL EU	Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC.
	TLV-ACGIH	ACGIH 2016

COBALT (II) CHLORIDE HEXAHYDRATE

Threshold Limit Value.

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
VLA	ESP	0,02			
WEL	GBR	0,1			
MAC	NLD	0,02			
TLV	ROU	0,05			
TLV-ACGIH		0,02			

Predicted no-effect concentration - PNEC.

Normal value in fresh water	0,0006	mg/l
Normal value in marine water	0,00236	mg/l
Normal value for fresh water sediment	9,5	mg/kg/
Normal value for marine water sediment	9,5	µg/kg/
Normal value of STP microorganisms	0,37	µg/l
Normal value for the terrestrial compartment	10,9	mg/kg/
		d

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers.			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral.			VND	0,12				
				mg/kg bw/d				
Inhalation.			0,014	VND			0,088	VND
			mg/m3				mg/m3	



SECTION 8. Exposure controls/personal protection. ... / >>

HYDROCHLORIC ACID

Threshold Limit Value.

Type	Country	TWA/8h		STEL/15min	
		mg/m ³	ppm	mg/m ³	ppm
MAK	DEU	3	2		
VLA	ESP	7,6	5	15	10
WEL	GBR	2	1	8	5
gas and aerosol mists					
AK	HUN	8		16	
VLEP	ITA	8	5	15	10
MAC	NLD	3	2	6	4
TLV	ROU	8	5	15	10
OEL	EU	8	5	15	10
TLV-ACGIH				2 (C)	

Predicted no-effect concentration - PNEC.

Normal value in fresh water	0,036	mg/l
Normal value in marine water	0,036	mg/l
Normal value for water, intermittent release	0,045	mg/l
Normal value of STP microorganisms	0,036	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers.				Effects on workers			
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation.					15 mg/m ³	VND	8 mg/m ³	VND

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
 VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

HYDROCHLORIC ACID

Methods for measurement of the workplace atmosphere have to correspond to the requirements of norm NIOSH 7903.

COBALT (II) CHLORIDE HEXAHYDRATE

Co - Methods for measurement of the workplace atmosphere have to correspond to the requirements of norm ISO 15202 - Biological Values, ACGIH: 15 µg/L Cobalt in urine (End of shift at end of workweek), DEU: 15 µg/L Cobaltin Urin, Luft Cobalt 0.025 mg/Kubikmeter (Expositionsende bzw. Schichtende; bei Langzeitexposition: nach mehreren vorangegangenen Schichten), ESP: 15 µg/L Cobalto en orina (Final de la semana laboral).

8.2. Exposure controls.

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration. Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

The product must be used inside a closed circuit, in a well-ventilated environment and with strong localised aspiration systems in place.

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category II professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type B filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS.

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

Product residues must not be indiscriminately disposed of with waste water or by dumping in waterways.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties.

Appearance	liquid
Colour	red
Odour	odourless
Odour threshold.	Not available.
pH.	0,5
Melting point / freezing point.	Not available.
Initial boiling point.	Not available.
Boiling range.	Not available.
Flash point.	> 60 °C.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Lower inflammability limit.	Not available.
Upper inflammability limit.	Not available.
Lower explosive limit.	Not available.
Upper explosive limit.	Not available.
Vapour pressure.	Not available.
Vapour density	Not available.
Relative density.	1,000
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature.	Not available.
Decomposition temperature.	Not available.
Viscosity	Not available.
Explosive properties	Not available.
Oxidising properties	Not available.

9.2. Other information.

Total solids (250°C / 482°F)	3,18 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity.

10.1. Reactivity.

There are no particular risks of reaction with other substances in normal conditions of use.

HYDROCHLORIC ACID

HYDROCHLORIC ACID 37%: Corrosive in contact with metals.

10.2. Chemical stability.

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions.

No hazardous reactions are foreseeable in normal conditions of use and storage.

COBALT (II) CHLORIDE HEXAHYDRATE

Risk of explosion with: Alkali metals.

HYDROCHLORIC ACID

HYDROCHLORIC ACID 37%: Exothermic reaction with: Amines, potassium permanganate, salts of oxyhalogenic acids, semimetallic oxides, semimetallic hydrogen compounds, Aldehydes, vinylmethyl ether, Risk of ignition or formation of inflammable gases or vapours with: carbides, lithium silicide, Fluorine, Generates dangerous gases or fumes in contact with: Aluminium, hydrides, formaldehyde, Metals, strong alkalis, Sulphides. Risk of explosion with: Alkali metals, conc. sulfuric acid.

10.4. Conditions to avoid.

None in particular. However the usual precautions used for chemical products should be respected.

SECTION 10. Stability and reactivity. ... / >>

10.5. Incompatible materials.

HYDROCHLORIC ACID
 HYDROCHLORIC ACID 37%: Alkalis, organic substances, strong oxidants and metals.

10.6. Hazardous decomposition products.

HYDROCHLORIC ACID
 HYDROCHLORIC ACID 37%: Above decomposition temperature hydrochloric acid fumes may develop.

SECTION 11. Toxicological information.

11.1. Information on toxicological effects.

HYDROCHLORIC ACID
 HYDROCHLORIC ACID 37% - Mixture - Acute oral toxicity, Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach - Acute inhalation toxicity, Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages: damage of respiratory tract - Skin irritation, Mixture causes burns. - Eye irritation, Mixture causes serious eye damage. Risk of blindness! - Specific target organ toxicity, single exposure, Target Organs: Respiratory system, Mixture may cause respiratory irritation.

COBALT (II) CHLORIDE HEXAHYDRATE
 Acute oral toxicity, absorption, Symptoms: Tremors, Diarrhoea - Acute inhalation toxicity, absorption, Symptoms: Irritation symptoms in the respiratory tract - Acute dermal toxicity, absorption, Skin irritation, Possible damages: slight irritation - Eye irritation, Possible damages: slight irritation - Sensitisation, May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction - CMR effects, Carcinogenicity: May cause cancer by inhalation - Mutagenicity: Suspected of causing genetic defects. Reproductive toxicity: May damage fertility.

ACUTE TOXICITY.

LC50 (Inhalation - vapours) of the mixture:	Not classified (no significant component).
LC50 (Inhalation - mists / powders) of the mixture:	Not classified (no significant component).
LD50 (Oral) of the mixture:	Not classified (no significant component).
LD50 (Dermal) of the mixture:	Not classified (no significant component).

HYDROCHLORIC ACID LC50 (Inhalation).	4,74 mg/l/1h Rat
---	------------------

COBALT (II) CHLORIDE HEXAHYDRATE LD50 (Oral).	766 mg/kg Rat
--	---------------

SKIN CORROSION / IRRITATION.
 Corrosive for the skin.

SERIOUS EYE DAMAGE / IRRITATION.
 Causes serious eye irritation.

RESPIRATORY OR SKIN SENSITISATION.
 Sensitising for the skin.

GERM CELL MUTAGENICITY.
 Suspected of causing genetic defects.

CARCINOGENICITY.
 May cause cancer.

REPRODUCTIVE TOXICITY.
 May damage fertility or the unborn child.

STOT - SINGLE EXPOSURE.
 Does not meet the classification criteria for this hazard class.

STOT - REPEATED EXPOSURE.
 Does not meet the classification criteria for this hazard class.

ASPIRATION HAZARD.
 Does not meet the classification criteria for this hazard class.



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SECTION 12. Ecological information.

This product is dangerous for the environment and is toxic for aquatic organisms. In the long term, it have negative effects on aquatic environment.

12.1. Toxicity.

HYDROCHLORIC ACID

LC50 - for Fish.

282 mg/l/96h

EC50 - for Crustacea.

0,00005 mg/l/48h

COBALT (II) CHLORIDE HEXAHYDRATE

LC50 - for Fish.

1,512 mg/l/96h *Oncorhynchus mykiss*

EC50 - for Crustacea.

6,8 mg/l/48h *Ceriodaphnia dubia*

EC10 for Algae / Aquatic Plants.

0,023 mg/l/72h *Pseudokirchnerella subcapitata*

Chronic NOEC for Fish.

0,739 mg/l *Pimephales promelas*

12.2. Persistence and degradability.

HYDROCHLORIC ACID

Solubility in water.

> 10000 mg/l

Biodegradability: Information not available.

COBALT (II) CHLORIDE HEXAHYDRATE

Solubility in water.

> 10000 mg/l

Biodegradability: Information not available.

12.3. Bioaccumulative potential.

Information not available.

12.4. Mobility in soil.

Information not available.

12.5. Results of PBT and vPvB assessment.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects.

HYDROCHLORIC ACID

HYDROCHLORIC ACID 37%: Forms corrosive mixtures with water even if diluted. Harmful effect due to pH shift. Discharge into the environment must be avoided.

SECTION 13. Disposal considerations.

13.1. Waste treatment methods.

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

Waste transportation may be subject to ADR restrictions.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information.

14.1. UN number.

ADR / RID, IMDG, IATA: 3082

ADR / RID:

In accordance with Special Provision 375, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to ADR provisions.

IMDG:

In accordance with Section 2.10.2.7 of IMDG Code, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to IMDG Code provisions.

SECTION 14. Transport information. ... / >>

IATA: In accordance with SP A197, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to IATA dangerous goods regulations.

14.2. UN proper shipping name.

ADR / RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (COBALT II CHLORIDE)
IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (COBALT II CHLORIDE)
IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (COBALT II CHLORIDE)

14.3. Transport hazard class(es).

ADR / RID: Class: 9 Label: 9



IMDG: Class: 9 Label: 9



IATA: Class: 9 Label: 9



14.4. Packing group.

ADR / RID, IMDG, IATA: III

14.5. Environmental hazards.

ADR / RID: Environmentally Hazardous.



IMDG: Marine Pollutant.



IATA: Environmentally Hazardous.



14.6. Special precautions for user.

ADR / RID:	HIN - Kemler: 90	Limited Quantities: 5 L	Tunnel restriction code: (E)
	Special Provision: -		
IMDG:	EMS: F-A, S-F	Limited Quantities: 5 L	
IATA:	Cargo:	Maximum quantity: 450 L	Packaging instructions: 964
	Pass.:	Maximum quantity: 450 L	Packaging instructions: 964
	Special Instructions:	A97, A158, A197	

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code.

Information not relevant.

SECTION 15. Regulatory information.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

Seveso Category - Directive 2012/18/EC: E2

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006.

Product.		
Point.	3	
Contained substance.		
Point.	28-30	COBALT (II) CHLORIDE HEXAHYDRATE



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SECTION 15. Regulatory information. ... / >>

Substances in Candidate List (Art. 59 REACH).
 COBALT (II) CHLORIDE HEXAHYDRATE

Substances subject to authorisation (Annex XIV REACH).
 None.

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
 None.

Substances subject to the Rotterdam Convention:
 None.

Substances subject to the Stockholm Convention:
 None.

Healthcare controls.

Workers exposed to this health-dangerous chemical agent must undergo sanitary checks carried out in compliance with 2004/37/EC directive.

WGK 2: Hazard to waters

15.2. Chemical safety assessment.

A chemical safety assessment has been performed for the following contained substances.
 HYDROCHLORIC ACID

SECTION 16. Other information.

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Carc. 1B	Carcinogenicity, category 1B
Muta. 2	Germ cell mutagenicity, category 2
Repr. 1B	Reproductive toxicity, category 1B
Acute Tox. 4	Acute toxicity, category 4
Skin Corr. 1B	Skin corrosion, category 1B
Skin Corr. 1C	Skin corrosion, category 1C
Eye Dam. 1	Serious eye damage, category 1
Eye Irrit. 2	Eye irritation, category 2
Skin Irrit. 2	Skin irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
Resp. Sens. 1	Respiratory sensitization, category 1
Skin Sens. 1	Skin sensitization, category 1
Aquatic Acute 1	Hazardous to the aquatic environment, acute toxicity, category 1
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic toxicity, category 1
Aquatic Chronic 2	Hazardous to the aquatic environment, chronic toxicity, category 2
Aquatic Chronic 3	Hazardous to the aquatic environment, chronic toxicity, category 3
Aquatic Chronic 4	Hazardous to the aquatic environment, chronic toxicity, category 4
H290	May be corrosive to metals.
H350i	May cause cancer by inhalation.
H341	Suspected of causing genetic defects.
H360F	May damage fertility.
H302	Harmful if swallowed.
H332	Harmful if inhaled.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road



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SECTION 16. Other information. ... / >>

- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EU) 1907/2006 (REACH) of the European Parliament
2. Regulation (EU) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.



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КОПИЯ ВЕРНА

Лидектор К.А. Половников

HI93717A-0 - Phosphate High Range Reagent A

Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code **HI93717A-0**
Product name **Phosphate High Range Reagent A**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Determination of Phosphate in Water Samples**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
Full address **str. Hanna Nr 1**
District and Country **457260 loc. Nusfalau (Salaj) Romania**
Tel. **+40 260607700**
Fax **+40 260607700**

e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2015/830.

Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Substance or mixture corrosive to metals, category 1	H290	May be corrosive to metals.
Skin corrosion, category 1A	H314	Causes severe skin burns and eye damage.
Serious eye damage, category 1	H318	Causes serious eye damage.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: **Danger**

Hazard statements:

H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.

Precautionary statements:

P280 Wear protective gloves / protective clothing / eye protection / face protection.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].



HI93717A-0 - Phosphate High Range Reagent A

SECTION 2. Hazards identification ... / >>

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor.
P390 Absorb spillage to prevent material damage.

Contains: SULPHURIC ACID

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Contains:

Identification	x = Conc. %	Classification 1272/2008 (CLP)
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SULPHURIC ACID

CAS	7664-93-9	$50 \leq x < 100$
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**Met. Corr. 1 H290, Skin Corr. 1A H314, Eye Dam. 1 H318,
Classification note according to Annex VI to the CLP Regulation: B**

EC	231-639-5
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INDEX	016-020-00-8
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Reg. no.	01-2119458838-20
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AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

CAS	12054-85-2	$1 \leq x < 5$
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EC	234-722-4
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INDEX	
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The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 30-60 minutes, opening the eyelids fully. Get medical advice/attention.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention.

INGESTION: Have the subject drink as much water as possible. Get medical advice/attention. Do not induce vomiting unless explicitly authorised by a doctor.

INHALATION: Get medical advice/attention immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

SULPHURIC ACID

SULPHURIC ACID 98%: Irritation and corrosion, Cough, Shortness of breath, Nausea, Vomiting, Diarrhoea, Pain, Risk of blindness.

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

The following applies to ammonium salts in general: after swallowing: local irritation symptoms, nausea, vomiting, diarrhoea. Systemic effect: after the uptake of very large quantities: drop in blood pressure, collapse, CNS disorders, spasms, narcotic conditions, respiratory paralysis, haemolysis. Symptoms of an acute molybdenum(VI) intoxication: diarrhoea, anaemia (decreased haemoglobin concentration in the blood), fatigue. Toxic effect on liver and kidneys after high doses.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available



SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

SULPHURIC ACID

SULPHURIC ACID 98%: Not combustible, Fire may cause evolution of Sulphur oxides.

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

Not combustible. Development of hazardous combustion gases or vapours possible in the event of fire. Fire may cause evolution of: nitrogen oxides.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed. Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

Hanna Instruments S.R.L.

HI93717A-0 - Phosphate High Range Reagent A

Revision nr.2
Dated 23/06/2020
Printed on 23/06/2020
Page n. 4 / 12
Replaced revision:1 (Dated 29/11/2016)

EN

SECTION 7. Handling and storage ... / >>

Storage class TRGS 510 (Germany): 8A

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

AUS	Österreich	Gesamte Rechtsvorschrift für Grenzwerteverordnung 2018, Fassung vom 17.10.2018
BEL	Belgique	AR du 11/3/2002. La liste est mise à jour pour 2017
BGR	България	МИНИСТЕРСТВО НА ТРУДА И СОЦИАЛНАТА ПОЛИТИКА МИНИСТЕРСТВО НА ЗДРАВЕОПАЗВАНЕТО НАРЕДБА No 13 от 30 декември 2003 г (4 Септември 2018г)
CHE	Suisse / Schweiz	Valeurs limites d'exposition aux postes de travail en Suisse: valeurs VME/VLE. Version Mars 2018 (SUVA)
CZE	Česká Republika	Nařízení vlády č. 246/2018 Sb. Nařízení vlády, kterým se mění nařízení vlády č. 361/2007 Sb., kterým se stanoví podmínky ochrany zdraví při práci, ve znění pozdějších předpisů
DEU	Deutschland	TRGS 900 - Seite 1 von 69 (Fassung 29.03.2019)- Liste der Arbeitsplatzgrenzwerte und Kurzzeitwerte
DNK	Danmark	Bekendtgørelse om ændring af bekendtgørelse om grænseværdier for stoffer og materialer1- BEK nr 655 af 31/05/2018
ESP	España	LÍMITES DE EXPOSICIÓN PROFESIONAL PARA AGENTES QUÍMICOS EN ESPAÑA 2019 (INSST)
EST	Eesti	Töökeskonna keemiliste ohutegurite piinormid. Vastu võetud Vabariigi Valitsuse 18. septembri 2001. a määrusega nr 293 (RT I 2001, 77, 460), jõustunud 29.09.2001. Muudetud järgmise määrusega (kuupäev, number, avaldamine Riigi Teatajas, jõustumise aeg): 11.10.2007 nr 223 (RT I 2007, 55, 369) 1.01.2008
FIN	Suomi	HTP-VÄRDEN 2018. Koncentrationer som befunnits skadliga. SOCIAL- OCH HÄLSOVÄRDSMINISTERIETS PUBLIKATIONER 10/2018
FRA	France	Valeurs limites d'exposition professionnelle aux agents chimiques en France. ED 984 - INRS
GBR	United Kingdom	EH40/2005 Workplace exposure limits (Third edition, published 2018)
GRC	Ελλάδα	ΕΦΗΜΕΡΙΔΑ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ - ΤΕΥΧΟΣ ΠΡΩΤΟ Αρ. Φύλλου 152 - 21 Αυγούστου 2018
HRV	Hrvatska	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/18)
HUN	Magyarország	A pénzügyminiszter 7/2018. (VIII. 29.) PM rendelete a munkahelyek kémiai biztonságáról szóló 25/2000. (IX. 30.) EüM-SZCSM együttes rendelet módosításáról
IRL	Éire	2018 Code of Practice for the Chemical Agents Regulations Safety Authority
ITA	Italia	DIRETTIVA (UE) 2017/164 DELLA COMMISSIONE del 31 gennaio 2017
LTU	Lietuva	LIETUVOS HIGIENOS NORMA HN 23:2011 „CHEMINIŲ MEDŽIAGŲ PROFESINIO POVEIKIO RIBINIAI DYDŽIAI. MATAVIMO IR POVEIKIO VERTINIMO BENDRIEJI REIKALAVIMAI. Nr. V-695/A1-272, 2018-06-12, paskelbta TAR 2018-06-15, i. k. 2018-09988
LVA	Latvija	Ūmisko vielu aroda ekspozīcijas robežvērtības (AER) darba vides gaisā 2018
NLD	Nederland	Regeling van de Staatssecretaris van Sociale Zaken en Werkgelegenheid van 13 juli 2018, 2018-0000118517 tot wijziging van de Arbeidsomstandighedenregeling in verband met de implementatie van Richtlijn 2017/164 in Bijlage XIII
NOR	Norge	Fastsatt av Arbeids- og sosialdepartementet 21. august 2018 med hjemmel i lov 17. juni 2005 nr. 62 om arbeidsmiljø, arbeidstid, stillingsvern mv. (arbeidsmiljøloven) § 1-3, § 1-4 og § 4-5
POL	Polska	ROZPORZĄDZENIE MINISTRA RODZINY, PRACY I POLITYKI SPOŁECZNEJ z dnia 12 czerwca 2018 r
ROU	România	HOTĂRÂRE nr. 584 din 2 august 2018 pentru modificarea Hotărârii Guvernului nr. 1.218/2006 privind stabilirea cerințelor minime de securitate și sănătate în muncă pentru asigurarea protecției lucrătorilor împotriva riscurilor legate de prezența agenților chimici
SVK	Slovensko	Nariadenie vlády č. 33/2018 Z. z. Nariadenie vlády Slovenskej republiky, ktorým sa mení a dopĺňa nariadenie vlády Slovenskej republiky č. 355/2006 Z. z. o ochrane zamestnancov pred rizikami súvisiacimi s expozíciou chemickým faktorom pri práci v znení neskorších predpisov
SVN	Slovenija	Uradni list Republike Slovenije 04.12.2018 - Uradnem listu RS št. 78 -PRAVILNIK o varovanju delavcev pred tveganji zaradi izpostavljenosti kemičnim snovem pri delu
SWE	Sverige	Hygieniska gränsvärden, AFS 2018:1
EU	OEL EU	Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2019

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SECTION 8. Exposure controls/personal protection ... / >>

SULPHURIC ACID

Threshold Limit Value

Type	Country	TWA/8h mg/m3	ppm	STEL/15min mg/m3	ppm	
MAK	AUS	0,1		0,3		INHAL
VLEP	BEL	1		3		
TLV	BGR	1				
MAK	CHE	0,1		0,1		INHAL
TLV	CZE	1		2		
AGW	DEU	0,1		0,1		INHAL
MAK	DEU	0,1		0,1		INHAL
TLV	DNK	1				
VLA	ESP	0,05				
TLV	EST	1		3		
HTP	FIN	0,05		0,1		
VLEP	FRA	0,05		3		THORA
WEL	GBR	0,05				THORA
TLV	GRC	0,05				
GVI/KGVI	HRV	1		3		
AK	HUN	1		1		
OEL	IRL	0,05	1			
VLEP	ITA	0,05				THORA
RD	LTU	1		3		
RV	LVA	1				
TGG	NLD	0,05				THORA
TLV	NOR	0,1				
NDS/NDSch	POL	1		3		
TLV	ROU	0,5		1		
NPEL	SVK	0,1		0,1		
MV	SVN	0,1				INHAL
NGV/KGV	SWE	0,1		0,2		
OEL	EU	0,05				
TLV-ACGIH		0,2				

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,0025	mg/l
Normal value in marine water	0,00025	mg/l
Normal value for fresh water sediment	0,002	mg/kg
Normal value for marine water sediment	0,002	mg/kg
Normal value of STP microorganisms	8,8	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers		Chronic local	Chronic systemic	Effects on workers			
	Acute local	Acute systemic			Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation					0,1 mg/m3	VND	0,05 mg/m3	VND

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

Threshold Limit Value

Type	Country	TWA/8h mg/m3	ppm	STEL/15min mg/m3	ppm	
HTP	FIN	0,5				Mo
TLV-ACGIH		0,5				Molybdenum soluble compound

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers		Chronic local	Chronic systemic	Effects on workers			
	Acute local	Acute systemic			Acute local	Acute systemic	Chronic local	Chronic systemic
Inhalation						VND	19,36 mg/m3	

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

SULPHURIC ACID

Methods for measurement of the workplace atmosphere have to correspond to the requirements of norm OSHA ID-113.

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

Methods for measurement of the workplace atmosphere have to correspond to the requirements of norms UNI EN 482 and UNI EN 689.

HI93717A-0 - Phosphate High Range Reagent A

SECTION 8. Exposure controls/personal protection ... / >>

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category III professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear a hood visor or protective visor combined with airtight goggles (see standard EN 166).

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type B filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	dense liquid	
Colour	colourless	
Odour	odourless	
Odour threshold	Not available	
pH	<1	
Melting point / freezing point	Not available	
Initial boiling point	Not available	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	1,4	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Total solids (250°C / 482°F)	55,74 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0



SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

SULPHURIC ACID

SULPHURIC ACID 98%: Decomposes at 450°C/842°F, has a corrosive effect, strong oxidising agent.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

SULPHURIC ACID

SULPHURIC ACID 98%: Stable under standard ambient condition.

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

SULPHURIC ACID

SULPHURIC ACID 98%: Violent reactions possible with: Water, Alkali metals, alkali compounds, Ammonia, Aldehydes, acetonitrile, Alkaline earth metals, alkalines, Acids, alkaline earth compounds, Metals, metal alloys, Oxides of phosphorus, phosphorus, hydrides, halogen-halogen compounds, oxyhalogenic compounds, permanganates, nitrates, carbides, combustible substances, organic solvent, acetylidene, Nitriles, organic nitro compounds, anilines, Peroxides, picrates, nitrides, lithium silicide, iron(III) compounds, bromates, chlorates, Amines, perchlorates, hydrogen peroxide.

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

Strong acids.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

Heating (decomposition).

10.5. Incompatible materials

SULPHURIC ACID

SULPHURIC ACID 98%: Animal/vegetable tissues, Metals. Contact with metals liberates hydrogen gas.

10.6. Hazardous decomposition products

SULPHURIC ACID

SULPHURIC ACID 98%: Sulphur oxide.

SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification. It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects

SULPHURIC ACID

SULPHURIC ACID 98% - Skin irritation: causes severe burns - Eye irritation: causes serious eye damage, risk of blindness!

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE

Specific target organ toxicity, single exposure, The substance or mixture is not classified as specific target organ toxicant, single exposure - Specific target organ toxicity, repeated exposure, The substance or mixture is not classified as specific target organ toxicant, repeated exposure - Aspiration hazard, Based on available data the classification criteria are not met.

Metabolism, toxicokinetics, mechanism of action and other information

Information not available



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SECTION 11. Toxicological information ... / >>

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

Not classified (no significant component)

LD50 (Oral) of the mixture:

Not classified (no significant component)

LD50 (Dermal) of the mixture:

Not classified (no significant component)

SULPHURIC ACID

LD50 (Oral)

2140 mg/kg Rat

SKIN CORROSION / IRRITATION

Corrosive for the skin

SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye damage

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity



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SECTION 12. Ecological information ... / >>

AMMONIUM HEPTAMOLYBDATE TETRAHYDRATE
EC50 - for Crustacea 1020 mg/l/48h

SULPHURIC ACID
LC50 - for Fish 42 mg/l/96h *Gambusia affinis*
EC50 - for Crustacea 42,5 mg/l/48h
EC50 - for Algae / Aquatic Plants > 100 mg/l/72h

12.2. Persistence and degradability

SULPHURIC ACID
Solubility in water 1000 - 10000 mg/l
Degradability: information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

SULPHURIC ACID
SULPHURIC ACID 98%: Biological effect: Forms corrosive mixture with water even if diluted. Harmful effect due to pH shift, Endangers drinking-water supplies if allowed to enter soil or water, Discharge into the environment must to be avoid.

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Waste transportation may be subject to ADR restrictions.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

14.1. UN number

ADR / RID, IMDG, IATA: 3264

14.2. UN proper shipping name

ADR / RID: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (SULPHURIC ACID) MIXTURE
IMDG: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (SULPHURIC ACID) MIXTURE
IATA: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (SULPHURIC ACID) MIXTURE



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SECTION 14. Transport information ... / >>

14.3. Transport hazard class(es)

ADR / RID: Class: 8 Label: 8



IMDG: Class: 8 Label: 8



IATA: Class: 8 Label: 8



14.4. Packing group

ADR / RID, IMDG, IATA: II

14.5. Environmental hazards

ADR / RID: NO
IMDG: NO
IATA: NO

14.6. Special precautions for user

ADR / RID:	HIN - Kemler: 80	Limited Quantities: 1 L	Tunnel restriction code: (E)
	Special Provision: -		
IMDG:	EMS: F-A, S-B	Limited Quantities: 1 L	
IATA:	Cargo:	Maximum quantity: 30 L	Packaging instructions: 855
	Pass.:	Maximum quantity: 1 L	Packaging instructions: 851
	Special Instructions:	A3, A803	

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006

Product	
Point	3

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)



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SECTION 15. Regulatory information ... / >>

WGK 1: Low hazard to waters

15.2. Chemical safety assessment

A chemical safety assessment has been performed for the following contained substances
SULPHURIC ACID

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Skin Corr. 1A	Skin corrosion, category 1A
Eye Dam. 1	Serious eye damage, category 1
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)
16. Regulation (EU) 2019/521 (XII Atp. CLP)

- The Merck Index. - 10th Edition



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SECTION 16. Other information ... / >>

- Handling Chemical Safety- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Product's classification is based on the calculation methods set out in Annex I of the CLP Regulation, unless otherwise indicated in sections 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified:

01 / 03 / 04 / 08 / 09 / 11 / 15.

Changed TLVs in section 8.1 for following countries:

AUS,



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Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code **HI93717B-0**
Product name **Phosphate HR Reagent B**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Determination of Phosphate in Water Samples.**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
Full address **str. Hanna Nr 1**
District and Country **457260 loc. Nusfalau (Salaj) Romania**
Tel. **+40 260607700**
Fax **+40 260607700**
e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2015/830.
Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:
Serious eye damage, category 1 **H318 Causes serious eye damage.**

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: **Danger**

Hazard statements:
H318 Causes serious eye damage.
EUH031 Contact with acids liberates toxic gas.

Precautionary statements:
P280 Wear protective gloves / eye protection / face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor.



SECTION 2. Hazards identification ... / >>

Contains: SODIUM METABISULFITE

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Contains:

Identification	Conc. %	Classification 1272/2008 (CLP)
SODIUM METABISULFITE		
CAS	7681-57-4 60,18	Acute Tox. 4 H302, Eye Dam. 1 H318, EUH031
EC	231-673-0	
INDEX	016-063-00-2	
Reg. no.	01-2119531326-45	

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.
SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention immediately. Wash contaminated clothing before using it again.
INHALATION: Remove to open air. If the subject stops breathing, administer artificial respiration. Get medical advice/attention immediately.
INGESTION: Get medical advice/attention immediately. Do not induce vomiting. Do not administer anything not explicitly authorised by a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

SODIUM METABISULFITE
 Irritation and corrosion. Risk of serious damage to eyes.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT
 The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.
 UNSUITABLE EXTINGUISHING EQUIPMENT
 None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
 Do not breathe combustion products. The product is combustible and, when the powder is released into the air in sufficient concentrations and in the presence of a source of ignition, it can create explosive mixtures with air. Fires may start or get worse by leakage of the solid product from the container, when it reaches high temperatures or through contact with sources of ignition.

SODIUM METABISULFITE
 Not combustible. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: Sulphur oxides.



5.3. Advice for firefighters

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GENERAL INFORMATION Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

If there are no contraindications, spray powder with water to prevent the formation of dust. Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product and place it in containers for recovery or disposal. If there are no contraindications, use jets of water to eliminate product residues.

Make sure the leakage site is well aired. Evaluate the compatibility of the container to be used, by checking section 10. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage**7.1. Precautions for safe handling**

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed. Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection**8.1. Control parameters**

Regulatory References:

BEL	Belgique	AR du 11/3/2002. La liste est mise à jour pour 2017
DNK	Danmark	Bekendtgørelse om ændring af bekendtgørelse om grænseværdier for stoffer og materialer1- BEK nr 655 af 31/05/2018
ESP	España	LÍMITES DE EXPOSICIÓN PROFESIONAL PARA AGENTES QUÍMICOS EN ESPAÑA 2019 (INSST)
FRA	France	Valeurs limites d'exposition professionnelle aux agents chimiques en France. ED 984 - INRS
GBR	United Kingdom	EH40/2005 Workplace exposure limits (Third edition, published 2018)
GRC	Ελλάδα	ΕΦΗΜΕΡΙΔΑ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ - ΤΕΥΧΟΣ ΠΡΩΤΟ Αρ. Φύλλου 152 - 21 Αυγούστου 2018
HRV	Hrvatska	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/18)
IRL	Éire	2018 Code of Practice for the Chemical Agents Regulations Safety Authority
NLD	Nederland	Regeling van de Staatssecretaris van Sociale Zaken en Werkgelegenheid van 13 juli 2018, 2018-0000118517 tot wijziging van de Arbeidsomstandighedenregeling in verband met de

SECTION 8. Exposure controls/personal protection ... / >>

NOR Norge implementatie van Richtlijn 2017/164 in Bijlage XIII
Fastsatt av Arbeids- og sosialdepartementet 21. august 2018 med hjemmel i lov 17. juni 2005 nr. 62 om arbeidsmiljø, arbeidstid, stillingsvæm mv. (arbeidsmiljøloven) § 1-3, § 1-4 og § 4-5
ACGIH 2019 ACGIH 2019

SODIUM METABISULFITE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
VLEP	BEL	5			
TLV	DNK	5			
VLA	ESP	5			
VLEP	FRA	5			
WEL	GBR	5			
TLV	GRC	5			
GVI/KGVI	HRV	5			
OEL	IRL	5			
TGG	NLD	5			
TLV	NOR	5			
TLV-ACGIH		5			

Predicted no-effect concentration - PNEC

Normal value in fresh water	1	mg/l
Normal value in marine water	0,1	mg/l
Normal value of STP microorganisms	75,4	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers				Effects on workers			
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral			VND	8,6 mg/kg bw/d				
Inhalation			VND	66 mg/m3			VND	225 mg/m3

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

During the risk assessment process, it is essential to take into consideration the ACGIH occupational exposure levels for inert particulate not otherwise classified (PNOC respirable fraction: 3 mg/m3; PNOC inhalable fraction: 10 mg/m3). For values above these limits, use a P type filter, whose class (1, 2 or 3) must be chosen according to the outcome of risk assessment.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

If the product may or must come into contact or react with acids, suitable technical and/or organisational measures should be taken to prevent the development of toxic and/or inflammable gases.

HAND PROTECTION

In the case of prolonged contact with the product, protect the hands with penetration-resistant work gloves (see standard EN 374).

Work glove material must be chosen according to the use process and the products that may form. Latex gloves may cause sensitivity reactions.

SKIN PROTECTION

Wear category I professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION

Use a type P filtering facemask, whose class (1, 2 or 3) and effective need, must be defined according to the outcome of risk assessment (see standard EN 149).

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	solid powder	
Colour	salmon pink	
Odour	pungent	
Odour threshold	Not available	
pH	4 - 4.5 pH, 17 g/L	
Melting point / freezing point	Not available	
Initial boiling point	Not applicable	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	2,1	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Total solids (250°C / 482°F) 100,00 %

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

The powders are potentially explosive when mixed with air.

SODIUM METABISULFITE

Generates dangerous gases or fumes in contact with: acids. Exothermic reaction with: Oxidizing agents, nitrites, nitrates, Sulphides.

10.4. Conditions to avoid

Avoid environmental dust build-up.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available



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КОПИЯ ВЕРНА

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SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification. It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects

SODIUM METABISULFITE

Eye irritation, Rabbit, Result: Eye irritation, Causes serious eye damage.

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

LD50 (Oral) of the mixture:

LD50 (Dermal) of the mixture:

SODIUM METABISULFITE

LD50 (Oral)

LD50 (Dermal)

Not classified (no significant component)

>2000 mg/kg

Not classified (no significant component)

1540 mg/kg Rat

> 2000 mg/kg Rat

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye damage

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE



КОПИЯ БЕРНА

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HI93717B-0 - Phosphate HR Reagent B

SECTION 11. Toxicological information ... / >>

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

SODIUM METABISULFITE

EC50 - for Crustacea

89 mg/l/48h Daphnia magna

EC50 - for Algae / Aquatic Plants

48 mg/l/72h Desmodesmus subspicatus

12.2. Persistence and degradability

SODIUM METABISULFITE

Solubility in water

> 10000 mg/l

Degradability: information not available

12.3. Bioaccumulative potential

SODIUM METABISULFITE

Partition coefficient: n-octanol/water

-3,7 Log Kow

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)



КОПИЯ ВЕРНА

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SECTION 14. Transport information ... / >>

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
 On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
 Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 1: Low hazard to waters

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Acute Tox. 4	Acute toxicity, category 4
Eye Dam. 1	Serious eye damage, category 1
H302	Harmful if swallowed.
H318	Causes serious eye damage.
EUH031	Contact with acids liberates toxic gas.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level



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КОПИЯ ВЕРНА

Директор К.А. Поповников

HI93717B-0 - Phosphate HR Reagent B**SECTION 16. Other information ... / >>**

- EmS: Emergency Schedule- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
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7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
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16. Regulation (EU) 2019/521 (XII Atp. CLP)

- The Merck Index. - 10th Edition
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- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Product's classification is based on the calculation methods set out in Annex I of the CLP Regulation, unless otherwise indicated in sections 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified:

01 / 02 / 03 / 04 / 05 / 08 / 09 / 11 / 15.





HI1271 сменный комбинированный рН-электрод для Checker Plus

Таблица характеристик

Спецификация

Материал корпуса	полипропилен
Электрод сравнения	одинарный, Ag/AgCl
Диафрагма/ скорость истечения	открытая
Электролит	висколен
Диапазон	рН: от 0 до 13
Максимальное давление	0.1 бар
Форма мембраны	сферическая (диаметр: 3 мм)
Рекомендуемый диапазон применения	от 0 до 50°C (от 32 до 122°F)
Температурный датчик	нет
Усилитель	нет
Разъем	винтовой
Применение	общие цели



Сведения об утилизации

Изделия не представляют опасности для окружающей среды, жизни и здоровья людей после окончания срока службы. Порядок утилизации изделия определяется Потребителем.

Свидетельство о приемке

Изделия изготовлены в соответствии с действующей технической документацией и признаны годными для эксплуатации.

Начальник ОТК



Грузинцев С.А.



КОПИЯ ВЕРНА

Директор К.А. Половников

Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code HI775S
Product name Alkalinity Reagent

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use Determination of Alkalinity in Fresh Water Samples.

1.3. Details of the supplier of the safety data sheet

Name Hanna Instruments S.R.L.
Full address str. Hanna Nr 1
District and Country 457260 loc. Nusfalau (Salaj)
Romania
Tel. +40 260607700
Fax +40 260607700
e-mail address of the competent person responsible for the Safety Data Sheet msds@hanna.ro

1.4. Emergency telephone number

For urgent inquiries refer to Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: -

2.2. Label elements

Hazard pictograms: -
Signal words: -
Hazard statements: -
Precautionary statements: -

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

SECTION 4. First aid measures ... / >>

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available



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КОПИЯ ВЕРНА

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SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Information not available

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

None required, unless indicated otherwise in the chemical risk assessment.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	liquid
Colour	green
Odour	odourless
Odour threshold	Not available
pH	3,7
Melting point / freezing point	Not available
Initial boiling point	Not available
Boiling range	Not available
Flash point	Not applicable
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Lower inflammability limit	Not available
Upper inflammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	1,00
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	not applicable
Oxidising properties	not applicable

9.2. Other information

Total solids (250°C / 482°F)	1,13 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.



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КОПИЯ ВЕРНА

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SECTION 10. Stability and reactivity ... />>

10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

10.4. Conditions to avoid

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled according to good industrial practices.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

Not classified (no significant component)

LD50 (Oral) of the mixture:

Not classified (no significant component)

LD50 (Dermal) of the mixture:

Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

СтройТехСнабжение



КОПИЯ ВЕРНА

Директор К.А. Половникова

SECTION 11. Toxicological information ... / >>

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable



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SECTION 14. Transport information ... / >>

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)

WGK 1: Low hazard to waters

15.2. Chemical safety assessment

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods



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КОПИЯ ВЕРНА

Директор К.А. Половников

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SECTION 16. Other information ... / >>

- IMO: International Maritime Organization- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

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8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
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11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)

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- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:
01 / 03 / 04 / 06 / 09 / 11 / 15.



Safety Data Sheet

According to Annex II to REACH - Regulation 2015/830

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code **HI93721-0**
 Product name **Iron HR Reagent**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Determination of Iron in Water Samples.**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
 Full address **str. Hanna Nr 1**
 District and Country **457260 loc. Nusfalau (Salaj)**
Romania
 Tel. **+40 260607700**
 Fax **+40 260607700**

e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of (EU) Regulation 2015/830.

Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Acute toxicity, category 4	H302	Harmful if swallowed.
Serious eye damage, category 1	H318	Causes serious eye damage.
Hazardous to the aquatic environment, chronic toxicity, category 3	H412	Harmful to aquatic life with long lasting effects.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: **Danger**

Hazard statements:

H302	Harmful if swallowed.
H318	Causes serious eye damage.
H412	Harmful to aquatic life with long lasting effects.
EUH031	Contact with acids liberates toxic gas.

Precautionary statements:



SECTION 2. Hazards identification ... / >>

P280	Wear protective gloves / eye protection / face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor.
Contains:	SODIUM METABISULFITE SODIUM DITHIONITE 1,10-PHENANTHROLINE

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Contains:

Identification	x = Conc. %	Classification 1272/2008 (CLP)
SODIUM METABISULFITE		
CAS	7681-57-4 9 ≤ x < 30	Acute Tox. 4 H302, Eye Dam. 1 H318, EUH031
EC	231-673-0	
INDEX	016-063-00-2	
Reg. no.	01-2119531326-45	
SODIUM DITHIONITE		
CAS	7775-14-6 9 ≤ x < 25	Self-heat. 1 H251, Acute Tox. 4 H302, EUH031
EC	231-890-0	
INDEX	016-028-00-1	
1,10-PHENANTHROLINE		
CAS	5144-89-8 0,5 ≤ x < 1	Acute Tox. 3 H301, Aquatic Acute 1 H400 M=10, Aquatic Chronic 1 H410 M=1
EC	200-629-2	
INDEX	613-092-00-8	

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.
SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention immediately. Wash contaminated clothing before using it again.
INHALATION: Remove to open air. If the subject stops breathing, administer artificial respiration. Get medical advice/attention immediately.
INGESTION: Get medical advice/attention immediately. Do not induce vomiting. Do not administer anything not explicitly authorised by a doctor.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

SODIUM METABISULFITE
Irritation and corrosion. Risk of serious damage to eyes.

SODIUM DITHIONITE
Irritant effects, Cough, respiratory paralysis, Shortness of breath, pain, Diarrhoea, Nausea, Vomiting, collapse, muscular weakness, death.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available



HI93721-0 - Iron HR Reagent

SECTION 5. Firefighting measures**5.1. Extinguishing media**

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products. The product is combustible and, when the powder is released into the air in sufficient concentrations and in the presence of a source of ignition, it can create explosive mixtures with air. Fires may start or get worse by leakage of the solid product from the container, when it reaches high temperatures or through contact with sources of ignition.

SODIUM METABISULFITE

Not combustible. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: Sulphur oxides.

SODIUM DITHIONITE

Combustible material, danger of spontaneous combustion! Risk of dust explosion. Development of hazardous combustion gases or vapours possible in the event of fire. Fire may cause evolution of: Sulphur oxides.

1,10-PHENANTHROLINE

Combustible. Development of hazardous combustion gases or vapours possible in the event of fire. Fire may cause evolution of: nitrogen oxides.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

If there are no contraindications, spray powder with water to prevent the formation of dust.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product and place it in containers for recovery or disposal. If there are no contraindications, use jets of water to eliminate product residues.

Make sure the leakage site is well aired. Evaluate the compatibility of the container to be used, by checking section 10. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage**7.1. Precautions for safe handling**

Ensure that there is an adequate earthing system for the equipment and personnel. In order to avoid the risk of fires and explosions, never use compressed air when handling. Keep away from heat, sparks and naked flames; do not smoke or use matches or lighters. Avoid

HI93721-0 - Iron HR Reagent

SECTION 7. Handling and storage ... / >>

leakage of the product into the environment. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Remove any contaminated clothes and personal protective equipment before entering places in which people eat.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Keep the product in clearly labelled containers. Keep containers well sealed. Store in a ventilated and dry place, far away from sources of ignition. Avoid violent blows. Avoid overheating. Avoid contact with water.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

BEL	Belgique	AR du 11/3/2002. La liste est mise à jour pour 2017
DNK	Danmark	Bekendtgørelse om ændring af bekendtgørelse om grænseværdier for stoffer og materialer1- BEK nr 655 af 31/05/2018
ESP	España	LÍMITES DE EXPOSICIÓN PROFESIONAL PARA AGENTES QUÍMICOS EN ESPAÑA 2019 (INSST)
FRA	France	Valeurs limites d'exposition professionnelle aux agents chimiques en France. ED 984 - INRS EH40/2005 Workplace exposure limits (Third edition, published 2018)
GBR	United Kingdom	
GRC	Ελλάδα	ΕΦΗΜΕΡΙΔΑ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ - ΤΕΥΧΟΣ ΠΡΩΤΟ Αρ. Φύλλου 152 - 21 Αυγούστου 2018
HRV	Hrvatska	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 91/18)
IRL	Éire	2018 Code of Practice for the Chemical Agents Regulations Safety Authority
NLD	Nederland	Regeling van de Staatssecretaris van Sociale Zaken en Werkgelegenheid van 13 juli 2018, 2018-0000118517 tot wijziging van de Arbeidsomstandighedenregeling in verband met de implementatie van Richtlijn 2017/164 in Bijlage XIII
NOR	Norge	Fastsatt av Arbeids- og sosialdepartementet 21. august 2018 med hjemmel i lov 17. juni 2005 nr. 62 om arbeidsmiljø, arbeidstid, stillingsvern mv. (arbeidsmiljøloven) § 1-3, § 1-4 og § 4-5
	TLV-ACGIH	ACGIH 2019

SODIUM METABISULFITE

Threshold Limit Value

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
VLEP	BEL	5			
TLV	DNK	5			
VLA	ESP	5			
VLEP	FRA	5			
WEL	GBR	5			
TLV	GRC	5			
GVI/KGVI	HRV	5			
OEL	IRL	5			
TGG	NLD	5			
TLV	NOR	5			
TLV-ACGIH		5			

Predicted no-effect concentration - PNEC

Normal value in fresh water	1	mg/l
Normal value in marine water	0,1	mg/l
Normal value of STP microorganisms	75,4	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral			VND	8,6 mg/kg bw/d				
Inhalation			VND	66 mg/m3			VND	225 mg/m3



SECTION 8. Exposure controls/personal protection ... / >>

SODIUM DITHIONITE

Predicted no-effect concentration - PNEC

Normal value in fresh water	1	mg/l
Normal value in marine water	0,1	mg/l
Normal value of STP microorganisms	8,98	mg/l

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral			VND	7,9 mg/kg bw/d				
Inhalation			VND	61 mg/m3			VND	206 mg/m3

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.
VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

During the risk assessment process, it is essential to take into consideration the ACGIH occupational exposure levels for inert particulate not otherwise classified (PNOC respirable fraction: 3 mg/m3; PNOC inhalable fraction: 10 mg/m3). For values above these limits, use a P type filter, whose class (1, 2 or 3) must be chosen according to the outcome of risk assessment.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

If the product may or must come into contact or react with acids, suitable technical and/or organisational measures should be taken to prevent the development of toxic and/or inflammable gases.

HAND PROTECTION

In the case of prolonged contact with the product, protect the hands with penetration-resistant work gloves (see standard EN 374).

Work glove material must be chosen according to the use process and the products that may form. Latex gloves may cause sensitivity reactions.

SKIN PROTECTION

Wear category I professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

In the presence of risks of exposure to splashes or squirts during work, adequate mouth, nose and eye protection should be used to prevent accidental absorption.

RESPIRATORY PROTECTION

Use a type P filtering facemask, whose class (1, 2 or 3) and effective need, must be defined according to the outcome of risk assessment (see standard EN 149).

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

Product residues must not be indiscriminately disposed of with waste water or by dumping in waterways.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	solid powder	
Colour	ivory	
Odour	pungent	
Odour threshold	Not available	
pH	5.5 - 6.0 pH, 17 g/L	
Melting point / freezing point	Not available	
Initial boiling point	Not applicable	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	



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SECTION 9. Physical and chemical properties ... / >>

Upper inflammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	2
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	Not available
Oxidising properties	Not available

9.2. Other information

Total solids (250°C / 482°F)	100,00 %
------------------------------	----------

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

SODIUM DITHIONITE

Danger of spontaneous combustion! Self-ignition possible due to air moisture. Risk of dust explosion.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

SODIUM DITHIONITE

In case of decomposition in closed containers and tubes risk of bursting due to buildup of overpressure.

1,10-PHENANTHROLINE

Sensitivity to light.

10.3. Possibility of hazardous reactions

The powders are potentially explosive when mixed with air.

SODIUM METABISULFITE

Generates dangerous gases or fumes in contact with: acids. Exothermic reaction with: Oxidizing agents, nitrites, nitrates, Sulphides.

SODIUM DITHIONITE

A risk of explosion and/or of toxic gas formation exists with the following substances: acids, Violent reactions possible with: Oxidizing agents, Water, salts of oxyhalogenic acids.

1,10-PHENANTHROLINE

Violent reactions possible with: Oxidizing agents, acids.

10.4. Conditions to avoid

Avoid environmental dust build-up.

SODIUM DITHIONITE

Exposure to moisture. Heating (decomposition). Caution! Temperatures > 50°C cause evolution of gas in closed containers. Overpressure produces a risk of bursting.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available



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SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
 It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects

SODIUM METABISULFITE

Eye irritation, Rabbit, Result: Eye irritation, Causes serious eye damage.

SODIUM DITHIONITE

Acute inhalation toxicity, Symptoms: Irritation symptoms in the respiratory tract, Cough, Shortness of breath - Skin irritation rabbit, Result: No irritation - Eye irritation, Possible damages: slight irritation - Sensitisation, May produce an allergic reaction.

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

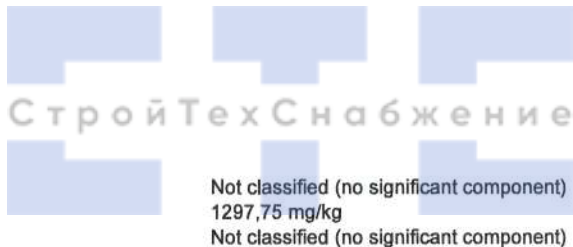
Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

LD50 (Oral) of the mixture:

LD50 (Dermal) of the mixture:



Not classified (no significant component)

1297,75 mg/kg

Not classified (no significant component)

SODIUM METABISULFITE

LD50 (Oral)

LD50 (Dermal)

1540 mg/kg Rat

> 2000 mg/kg Rat

1,10-PHENANTHROLINE

LD50 (Oral)

132 mg/kg Rat

SODIUM DITHIONITE

LD50 (Oral)

2500 mg/kg Rat

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Causes serious eye damage

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class



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SECTION 11. Toxicological information ... / >>

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

This product is dangerous for the environment and the aquatic organisms. In the long term, it have negative effects on aquatic environment.

12.1. Toxicity

SODIUM METABISULFITE

EC50 - for Crustacea

89 mg/l/48h Daphnia magna

EC50 - for Algae / Aquatic Plants

48 mg/l/72h Desmodesmus subspicatus

SODIUM DITHIONITE

LC50 - for Fish

46 mg/l/96h Leuciscus idus

EC50 - for Crustacea

98 mg/l/48h Daphnia magna

EC50 - for Algae / Aquatic Plants

206 mg/l/72h Green algae

12.2. Persistence and degradability

SODIUM METABISULFITE

Solubility in water

> 10000 mg/l

Degradability: information not available

SODIUM DITHIONITE

Solubility in water

> 10000 mg/l

Degradability: information not available

12.3. Bioaccumulative potential

SODIUM METABISULFITE

Partition coefficient: n-octanol/water

-3,7 Log Kow

1,10-PHENANTHROLINE

Partition coefficient: n-octanol/water

1,78 Log Kow

SODIUM DITHIONITE

Partition coefficient: n-octanol/water

< -4,7 Log Kow

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

SODIUM DITHIONITE

Biological effects: Reacts with water to form toxic decomposition products.

СтройТехСнабжение



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Hanna Instruments S.R.L.

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Revision nr.3
Dated 24/06/2020
Printed on 24/06/2020
Page n. 9 / 11
Replaced revision:2 (Dated 31/01/2018)

EN

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

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SECTION 15. Regulatory information ... / >>

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 1: Low hazard to waters

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Self-heat. 1	Self-heating substance or mixture, category 1
Acute Tox. 3	Acute toxicity, category 3
Acute Tox. 4	Acute toxicity, category 4
Eye Dam. 1	Serious eye damage, category 1
Aquatic Acute 1	Hazardous to the aquatic environment, acute toxicity, category 1
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic toxicity, category 1
Aquatic Chronic 3	Hazardous to the aquatic environment, chronic toxicity, category 3
H251	Self-heating: may catch fire.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H318	Causes serious eye damage.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
EUH031	Contact with acids liberates toxic gas.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament



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SECTION 16. Other information ... / >>

9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)
16. Regulation (EU) 2019/521 (XII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Product's classification is based on the calculation methods set out in Annex I of the CLP Regulation, unless otherwise indicated in sections 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified:

01 / 03 / 08 / 09 / 15 / 16.

СтройТехСнабжение



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КОПИЯ ВЕРНА

Директор К.А. Половников

Safety Data Sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code **HI93709A-0**
Product name **Manganese High Range Reagent A**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use **Determination of Manganese in Water Samples.**

1.3. Details of the supplier of the safety data sheet

Name **Hanna Instruments S.R.L.**
Full address **str. Hanna Nr 1**
District and Country **457260 loc. Nusfalau (Salaj) Romania**
Tel. **+40 260607700**
Fax **+40 260607700**
e-mail address of the competent person responsible for the Safety Data Sheet **msds@hanna.ro**

1.4. Emergency telephone number

For urgent inquiries refer to **Emergency Number - International: +1 7035273887 - UK, London: +44 8708200418 - CHEMTREC 24 hours/365 days**

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements).

Hazard classification and indication: —

2.2. Label elements

Hazard pictograms: —
Signal words: —
Hazard statements: —
Precautionary statements: —

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

The product does not contain substances classified as being hazardous to human health or the environment pursuant to the provisions Regulation (EU) 1272/2008 (CLP) (and subsequent amendments and supplements) in such quantities as to require the statement.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

SECTION 4. First aid measures ... / >>

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.

UNSUITABLE EXTINGUISHING EQUIPMENT

None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Do not breathe combustion products. The product is combustible and, when the powder is released into the air in sufficient concentrations and in the presence of a source of ignition, it can create explosive mixtures with air. Fires may start or get worse by leakage of the solid product from the container, when it reaches high temperatures or through contact with sources of ignition.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

During the risk assessment process, it is essential to take into consideration the ACGIH occupational exposure levels for inert particulate not otherwise classified (PNOC respirable fraction: 3 mg/m³; PNOC inhalable fraction: 10 mg/m³). For values above these limits, use a P type filter, whose class (1, 2 or 3) must be chosen according to the outcome of risk assessment.

8.2. Exposure controls

Comply with the safety measures usually applied when handling chemical substances.

HAND PROTECTION

None required.

SKIN PROTECTION

None required.

EYE PROTECTION

None required.

RESPIRATORY PROTECTION

Use a type P filtering facemask, whose class (1, 2 or 3) and effective need, must be defined according to the outcome of risk assessment (see standard EN 149).

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	solid powder	
Colour	white	
Odour	odourless	
Odour threshold	Not available	
pH	6.0 - 6.3 pH, 15 g/L	
Melting point / freezing point	Not available	
Initial boiling point	Not applicable	
Boiling range	Not available	
Flash point	Not applicable	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	
Vapour density	Not available	
Relative density	2,3	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	not applicable	
Oxidising properties	not applicable	

9.2. Other information

Total solids (250°C / 482°F) 100,00 %

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.



КОПИЯ ВЕРНА

Директор К.А. Половников



SECTION 10. Stability and reactivity ... / >>

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

The powders are potentially explosive when mixed with air.

10.4. Conditions to avoid

Avoid environmental dust build-up.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled according to good industrial practices.

11.1. Information on toxicological effects

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

LC50 (Inhalation) of the mixture:

Not classified (no significant component)

LD50 (Oral) of the mixture:

Not classified (no significant component)

LD50 (Dermal) of the mixture:

Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

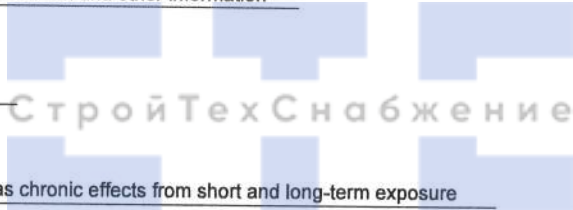
Does not meet the classification criteria for this hazard class

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class



SECTION 11. Toxicological information ... / >>

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste. Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations. Solid residues may be suitable for disposal in an authorised landfill site.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number

Not applicable



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SECTION 14. Transport information ... / >>

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EC: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
None

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 3: Severe hazard to waters

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%



КОПИЯ ВЕРНА

Директор К.А. Половников

SECTION 16. Other information ... / >>

- IMDG: International Maritime Code for dangerous goods- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2018/1480 (XIII Atp. CLP)

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

01.



КОПИЯ ВЕРНА

Директор К.А. Половников

Safety data sheet according to Regulation (EC) No. 1907/2006

SECTION 1. Identification of the substance/mixture and of the company/undertaking.

1.1. Product identifier.

Code. HI93709B-0
 Product name. Manganese HR Reagent B

1.2. Relevant identified uses of the substance or mixture and uses advised against.

Intended use. Determination of Manganese in Water Samples.

1.3. Details of the supplier of the safety data sheet.

Name. Hanna Instruments S.R.L.
 Full address. str. Hanna Nr 1
 District and Country. 457260 loc. Nusfalau (Sala)
 Romania
 Tel. (+40) 260607700
 Fax. (+40) 260607700
 e-mail address of the competent person responsible for the Safety Data Sheet. msds@hanna.ro

1.4. Emergency telephone number.

For urgent inquiries refer to. Emergency Number - International: +(1)-703-527-3887 - UK, London: +(44)-870-8200418 - CHEMTREC 24 hours/365 days

SECTION 2. Hazards identification.

2.1. Classification of the substance or mixture.

The product is classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of EC Regulation 1907/2006 and subsequent amendments.

Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Oxidising solid, category 2	H272	May intensify fire; oxidiser.
Eye irritation, category 2	H319	Causes serious eye irritation.
Skin irritation, category 2	H315	Causes skin irritation.
Specific target organ toxicity - single exposure, category 3	H335	May cause respiratory irritation.

2.2. Label elements.

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: Danger

Hazard statements:

H272	May intensify fire; oxidiser.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.

Precautionary statements:

SECTION 2. Hazards identification. ... / >>

P210	Keep away from heat.
P220	Keep and store away from clothing and combustible materials.
P261	Avoid breathing dust, fume, gas, mist, vapours, spray.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER or doctor, if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice / attention.
P362	Take off contaminated clothing.
P404	Store in a closed container.

Contains: POTASSIUM PERIODATE

2.3. Other hazards.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients.

3.1. Substances.

Information not relevant.

3.2. Mixtures.

Contains:

Identification.	x = Conc. %.	Classification 1272/2008 (CLP).
POTASSIUM PERIODATE		
CAS. 7790-21-8	50 ≤ x < 100	Ox. Sol. 2 H272, Eye Irrit. 2 H319, Skin Irrit. 2 H315, STOT SE 3 H335
EC. 232-196-0		
INDEX.		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures.

4.1. Description of first aid measures.

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.

SKIN: Remove contaminated clothing. Wash immediately with plenty of water. If irritation persists, get medical advice/attention. Wash contaminated clothing before using it again.

INHALATION: Remove to open air. In the event of breathing difficulties, get medical advice/attention immediately.

INGESTION: Get medical advice/attention. Induce vomiting only if indicated by the doctor. Never give anything by mouth to an unconscious person, unless authorised by a doctor.

4.2. Most important symptoms and effects, both acute and delayed.

Specific information on symptoms and effects caused by the product are unknown.
 For symptoms and effects caused by the contained substances, see chap. 11.

POTASSIUM PERIODATE

Cough, Shortness of breath, Headache, Nausea, Vomiting.

4.3. Indication of any immediate medical attention and special treatment needed.

Information not available.

SECTION 5. Firefighting measures.

5.1. Extinguishing media.

SUITABLE EXTINGUISHING EQUIPMENT

Extinguishing substances are: carbon dioxide and chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapours and protect those trying to stem the leak.

UNSUITABLE EXTINGUISHING EQUIPMENT



SECTION 5. Firefighting measures. ... / >>

Do not use jets of water.
 Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

5.2. Special hazards arising from the substance or mixture.

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

If large quantities of the product are involved in a fire, they can make it considerably worse. Do not breathe combustion products.

POTASSIUM PERIODATE

Hydrogen iodide, Potassium oxides.

5.3. Advice for firefighters.

GENERAL INFORMATION

In the case of fire, use jets of water to cool the containers to prevent the risk of explosions (product decomposition and excess pressure) and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Remove all containers containing the product from the fire, if it is safe to do so.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures.

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions.

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up.

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections.

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling.

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities.

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed.

Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

Storage class TRGS 510 (Germany):

5.1B

7.3. Specific end use(s).

Information not available.



SECTION 8. Exposure controls/personal protection.

8.1. Control parameters.

Information not available.

8.2. Exposure controls.

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration. Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category II professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type B filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS.

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties.

Appearance	solid powder
Colour	white
Odour	odourless
Odour threshold.	Not available.
pH.	5.2 - 5.5 pH, 10 g/L
Melting point / freezing point.	Not available.
Initial boiling point.	Not available.
Boiling range.	Not available.
Flash point.	> 60 °C.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Lower inflammability limit.	Not available.
Upper inflammability limit.	Not available.
Lower explosive limit.	Not available.
Upper explosive limit.	Not available.
Vapour pressure.	Not available.
Vapour density	Not available.
Relative density.	Not available.
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature.	Not available.
Decomposition temperature.	Not available.
Viscosity	Not available.
Explosive properties	Not available.
Oxidising properties	Not available.



SECTION 9. Physical and chemical properties. ... / >>

9.2. Other information.

Total solids (250°C / 482°F)	100,00 %
VOC (Directive 2010/75/EC) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity.

10.1. Reactivity.

Information not available.

10.2. Chemical stability.

Information not available.

10.3. Possibility of hazardous reactions.

The product may react violently with water.

10.4. Conditions to avoid.

Avoid overheating. Prevent moisture or water from penetrating inside the containers.

10.5. Incompatible materials.

POTASSIUM PERIODATE
 Strong reducing agents, Powdered metals, Amines.

10.6. Hazardous decomposition products.

Information not available.

СтройТехСнабжение

SECTION 11. Toxicological information.

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.

It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects.

POTASSIUM PERIODATE

Inhalation, May cause respiratory irritation. Potential health effects, Inhalation May be harmful if inhaled. Causes respiratory tract irritation - Ingestion May be harmful if swallowed - Skin, May be harmful if absorbed through skin. Causes skin irritation - Eyes, Causes serious eye irritation - Signs and Symptoms of Exposure, Cough, Shortness of breath, Headache, Nausea, Vomiting.

ACUTE TOXICITY.

LC50 (Inhalation - vapours) of the mixture:	Not classified (no significant component).
LC50 (Inhalation - mists / powders) of the mixture:	Not classified (no significant component).
LD50 (Oral) of the mixture:	Not classified (no significant component).
LD50 (Dermal) of the mixture:	Not classified (no significant component).

SKIN CORROSION / IRRITATION.

Causes skin irritation.

SERIOUS EYE DAMAGE / IRRITATION.

Causes serious eye irritation.

RESPIRATORY OR SKIN SENSITISATION.

Does not meet the classification criteria for this hazard class.

GERM CELL MUTAGENICITY.

Does not meet the classification criteria for this hazard class.

CARCINOGENICITY.

Does not meet the classification criteria for this hazard class.



SECTION 11. Toxicological information. ... / >>

REPRODUCTIVE TOXICITY.

Does not meet the classification criteria for this hazard class.

STOT - SINGLE EXPOSURE.

May cause respiratory irritation.

STOT - REPEATED EXPOSURE.

Does not meet the classification criteria for this hazard class.

ASPIRATION HAZARD.

Does not meet the classification criteria for this hazard class.

SECTION 12. Ecological information.

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity.

Information not available.

12.2. Persistence and degradability.

POTASSIUM PERIODATE

Solubility in water. > 10000 mg/l

12.3. Bioaccumulative potential.

Information not available.

12.4. Mobility in soil.

Information not available.

12.5. Results of PBT and vPvB assessment.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects.

Information not available.

SECTION 13. Disposal considerations.

13.1. Waste treatment methods.

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

Waste transportation may be subject to ADR restrictions.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information.

14.1. UN number.

ADR / RID, IMDG, IATA: 1479

14.2. UN proper shipping name.

ADR / RID: OXIDIZING SOLID, N.O.S. (POTASSIUM PERIODATE) MIXTURE

IMDG: OXIDIZING SOLID, N.O.S. (POTASSIUM PERIODATE) MIXTURE

IATA: OXIDIZING SOLID, N.O.S. (POTASSIUM PERIODATE) MIXTURE



SECTION 14. Transport information. ... / >>

14.3. Transport hazard class(es).

ADR / RID: Class: 5.1 Label: 5.1



IMDG: Class: 5.1 Label: 5.1



IATA: Class: 5.1 Label: 5.1



14.4. Packing group.

ADR / RID, IMDG, IATA: III

14.5. Environmental hazards.

ADR / RID: NO
 IMDG: NO
 IATA: NO

14.6. Special precautions for user.

ADR / RID:	HIN - Kemler: 50	Limited Quantities: 5 kg	Tunnel restriction code: (E)
	Special Provision: -		
IMDG:	EMS: F-A, S-Q	Limited Quantities: 5 kg	
IATA:	Cargo:	Maximum quantity: 100 Kg	Packaging instructions: 563
	Pass.:	Maximum quantity: 25 Kg	Packaging instructions: 559
	Special Instructions:	A3	

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code.

Information not relevant.

SECTION 15. Regulatory information.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.

Seveso Category - Directive 2012/18/EC: P8

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006.
Product Point: 3

Substances in Candidate List (Art. 59 REACH).
 On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH).
 None.

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
 None.

Substances subject to the Rotterdam Convention:
 None.

Substances subject to the Stockholm Convention:
 None.

Healthcare controls.
 Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.



SECTION 15. Regulatory information. ... / >>

WGK 3: Severe hazard to waters

15.2. Chemical safety assessment.

No chemical safety assessment has been processed for the mixture and the substances it contains.

SECTION 16. Other information.

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Ox. Sol. 2	Oxidising solid, category 2
Eye Irrit. 2	Eye irritation, category 2
Skin Irrit. 2	Skin irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
H272	May intensify fire; oxidiser.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EU) 1907/2006 (REACH) of the European Parliament
2. Regulation (EU) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
4. Regulation (EU) 2015/830 of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament

- The Merck Index. - 10th Edition
- Handling Chemical Safety



SECTION 16. Other information. ... / >>

- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:

The following sections were modified:

14.



© EPY 9.2.8 - SDS 1003

КОПИЯ ВЕРНА

Директор К.А. Половников

Метод 8008

FerroVer® Метод*
(0.02 ... 3.00 мг/л)

Пакетированные реагенты или
Ампулы AccuVac®

Область применения: Для воды, сточной воды, и морской воды; для определения общего железа требуется предварительное разложение пробы; рекомендована USEPA для сточных вод**

* Адаптированная методика из сборника "Стандартные методы анализа обычных и сточных вод"

** *Federal Register*, June 27, 1980; 45 (126:43459)



Замечания и рекомендации

- Для определения общего железа в соответствии с требованиями EPA необходимо предварительное разложение пробы. Описание процедуры см. в *Разделе 4*.
- Для повышения точности измерений для каждой новой партии реагентов определяйте значение контрольного (холостого) опыта, для чего производят измерение, используя в качестве образца дистиллированную воду. Полученное значение в дальнейшем вычитайте из всех результатов определений с использованием данной партии реагента(ов). Программное обеспечение Odyssey позволяет сохранять в памяти прибора значение контрольного опыта и автоматически вычитать его из всех последующих измерений (см. инструкцию к прибору).
- В присутствии железа разовьется оранжевая окраска.
- Некоторое количество не растворившегося реагента не повлияет на точность определения.

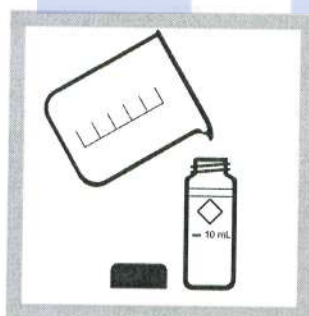


Пакетированные реагенты

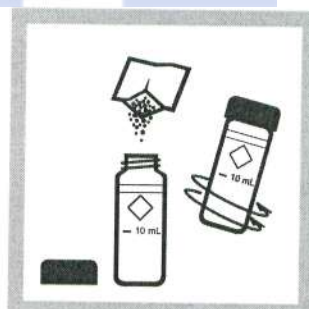
Метод 8008



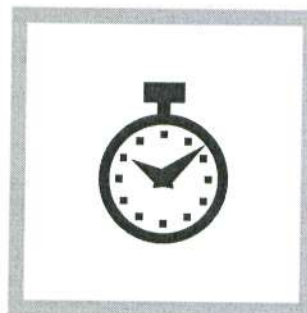
1. Нажмите **Hach Programs**.
Выберите программу **265 Iron, FerroVer**.
Нажмите **Start**.



2. Наполните измерительную кювету 10-мл образца.



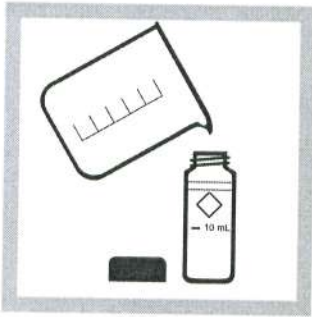
3. Добавьте в кювету содержимое одного пакетика с реагентом FerroVer (подготовленный образец). Перемешайте (вращая).



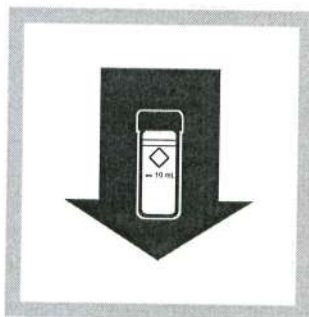
4. Нажмите на изображение таймера. Нажмите **OK**. Начнется отсчет трех-минутного периода реакции.
(Для образцов со следами ржавчины реакция должна протекать не менее 5 минут).



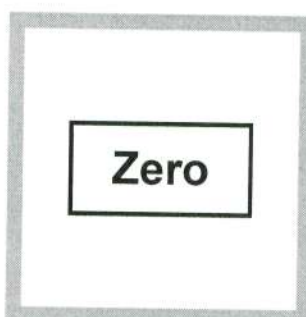
Железо общее



5. Наполните другую кювету (нулевую) 10 мл образца.



6. После сигнала таймера, поместите нулевой раствор в кюветодержатель.



7. Нажмите **Zero**.
На дисплее появится:
0.00 mg/L Fe



8. Поместите в кюветодержатель подготовленный образец.

Для DR/2400:
Нажмите **Read**.

На дисплее появится результат в мг/л Fe.

СтройТехСнабжение

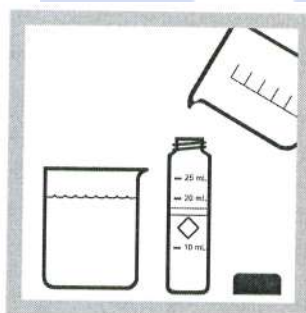


Ампулы AccuVac

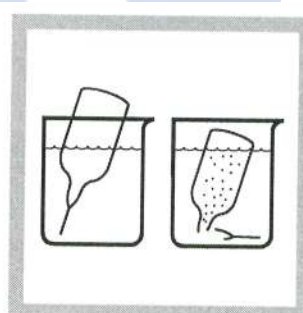
Метод 8008



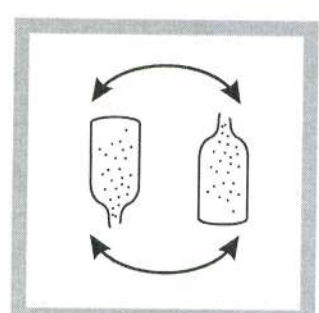
1. Нажмите **Nach Programs**.
Выберите программу **267 Iron, FerroVer AV**.
Нажмите **Start**.



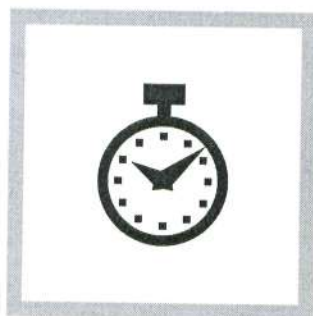
2. Наполните измерительную кювету 25 мл образца. Отберите не менее 40 мл образца в 50-мл стакан.



3. Наполните образцом ампулу FerroVer AccuVac. Держите кончик погруженным, пока ампула полностью не наполнится.



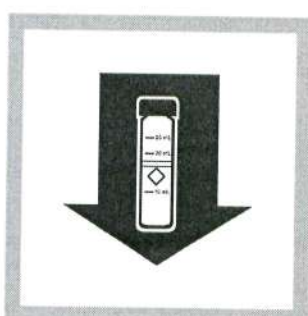
4. Быстро несколько раз переверните ампулу для перемешивания. Вытрите следы жидкости и отпечатки пальцев.



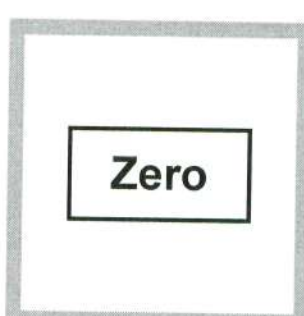
5. Нажмите на изображение таймера. Нажмите **OK**.

Начнется отсчет трехминутного периода реакции.

(Для образцов со следами ржавчины реакция должна протекать не менее 5 минут).



6. После сигнала таймера, поместите нулевой раствор в кюветодержатель.



7. Нажмите **Zero**.
На дисплее появится:
0.00 mg/L Fe



8. Поместит в кюветодержатель прореагировавшую ампулу AccuVac.

Для DR/2400:
Нажмите **Read**.

На дисплее появится результат в мг/л Fe.

Мешающие влияния

Мешающее вещество	Уровень мешающего влияния, причина и Ваши действия
Железо, большие конц.	Препятствует развитию окраски. Разбавьте образец и повторите анализ.
Железа окись	Требуется среднее или жесткое разложение или использование аппарата Digesdahl. После разложение доведите pH образца до 3–5 при помощи гидроксида натрия (Кат. № 2450-32), после чего приступайте к анализу.
Кальций, Ca ²⁺	Не влияет при концентрации менее 10,000 мг/л по CaCO ₃ .
Магний, Mg ²⁺	Не влияет при концентрации до 100,000 мг/л по CaCO ₃ .
Медь, Cu ²⁺	Не оказывает мешающего влияния. Маскирующий агент входит в состав реагента FerroVer
Молибдат	Не влияет при концентрации менее 50 мг/л по Mo.
Мутность	<ol style="list-style-type: none"> 1. Добавьте к нулевому раствору 0.1 г RoVer Rust Remover (Кат. № 300-01). Перемешайте 2. Занулите прибор с использованием этого нулевого раствора. 3. Если образец остается мутным, добавьте 0.6 г реагента f RoVer к 75-мл образца и оставьте на 5 минут. 4. Отфильтруйте, используя мембранный стеклянный фильтр (Кат. № 2530-00) и фильтродержатель (Кат. № 2340-00). 5. Используйте отфильтрованный образец на шаге 2 и 5.
Сульфиды, в большой концентрации, S ²⁻	<ol style="list-style-type: none"> 1. Обработайте под вытяжкой. Добавьте 5 мл соляной кислоты, марки не хуже ACS (Кат. № 134-49) к 100 мл образца в 250-мл колбе Эйленмейера. Кипятите 20 минут. 2. Охладите. Доведите pH до 3–5 при помощи гидроксида натрия (Кат. № 2450-32). Доведите объем до 100 мл деионизованной водой. 3. Проведите анализ.
Хлорид, Cl ⁻	Не влияют при концентрации менее 185,000 мг/л.
Высокая буферная емкость	Доведите pH до 3–5. См. <i>Раздел 3.3 Мешающие влияния.</i>
Предельные значения pH	Доведите pH до 3–5. См. <i>Раздел 3.3 Мешающие влияния.</i>

Железо общее

Отбор, хранение и консервирование пробы

Отбирайте образцы в пластиковые или стеклянные бутылки, предварительно очищенные раствором соляной кислоты и промытые деионизованной водой. В случае, если анализ производится немедленно, добавка кислоты не нужна. Для консервирования образца доведите pH до 2 или ниже при помощи концентрированной азотной кислоты (примерно 2 мл на литр образца) (Кат. № 152-49). Законсервированные образцы можно хранить до 6 месяцев при комнатной температуре. Пере анализом установите pH на уровне от 3 до 5 при помощи 5.0 N стандартного раствора гидроксида натрия (Кат. № 2450-32). Скорректируйте полученные результаты в соответствии с добавленными объемами; см. *Раздел 3.1.3 Расчет поправки на добавленные объемы.*

Если необходимо определить только растворенное железо, отфильтруйте образец перед добавлением кислоты.

Проверка правильности

Метод стандартных добавок

1. После получения результата анализа, оставьте кювету с образцом (образец без добавки) в кюветном отделении прибора.
2. Нажмите **Options**. Нажмите **Standard Additions**. На дисплее появится краткая информация о методе добавок.
3. Нажмите **OK** для подтверждения принятых по умолчанию значений концентрации стандарта, объема образца и объема добавки. Для изменения этих значений нажмите **Edit**. После подтверждения параметров метода в верхней строке появится значение для образца без добавки. См. *Метод стандартных добавок* в инструкции к спектрофотометру *Odyssey* для дополнительной информации.
4. Вскройте ампулу со стандартом 50-мг/л железа.
5. Приготовьте образец с добавкой 0.1 мл, для чего добавьте 0.1 мл стандартного раствора к прореагировавшему образцу без добавки. Нажмите на изображение таймера. После звукового сигнала таймера снимите показания.
6. Приготовьте образец с добавкой 0.2 мл, для чего добавьте 0.1 мл стандартного раствора к прореагировавшему образцу с добавкой 0.1 мл. Нажмите на изображение таймера. После звукового сигнала таймера снимите показания.
7. Приготовьте образец с добавкой 0.3 мл, для чего добавьте 0.1 мл стандартного раствора к прореагировавшему образцу с добавкой 0.1 мл. Нажмите на изображение таймера. После звукового сигнала таймера снимите показания.
Каждая добавка должна давать 100% выход.

Замечание: Для ампул *AssiVac*, наполните три перемешивающих цилиндра (Кат. № 1896-41) 50 мл образца добавьте в них по 0.2 мл, 0.4 мл, и 0.6 мл стандарта соответственно. Перелейте из каждого цилиндра по 40 мл в три 50-мл стакана (Кат. № 500-41). Проанализируйте все три образца с добавкой в соответствии вышеописанной методикой. Подтверждайте каждое полученное значение нажатием **Read**. Каждая добавка должна давать примерно 100% выход.

8. После окончания измерения серии, нажмите **Graph** для просмотра аппроксимирующей прямой, проходящей через точки стандартных добавок с учетом мешающего влияния матрицы. Для того, чтобы увидеть соотношение между реальной и "идеальной прямой", соответствующей 100% выходу по каждой добавке, нажмите **View: Fit**, затем выберите **Ideal Line** и нажмите **OK**.

См. *Раздел 3.2.2 Стандартные добавки* для более подробной информации.

Метод стандартного раствора

1. Приготовьте стандартный раствор 1.00-мг/л Fe, для чего отберите пипеткой 1.00 мл стандартного раствора железа концентрацией 100-мг/л в мерную колбу на 100-мл и доведите до метки деионизованной водой. Закройте пробкой и перемешайте. Готовьте раствор ежедневно. Проведите анализ по вышеприведенной схеме.
2. Для настройки калибровочной кривой с использованием значения, полученного при измерении стандартного раствора 1.0-мг/л, в меню текущей программы нажмите **Options**. Нажмите **Standard Adjust**.
3. Выберите **On**. Нажмите **Adjust** для подтверждения отображаемой концентрации (обратите внимание на соответствие химической формы). Если используется стандарт с другой концентрацией, введите его значение и нажмите **OK**. Нажмите **Adjust**.

Метрологические характеристики метода

Правильность
Стандарт: 1.000 мг/л Fe

Программа	Доверительный интервал 95%
265	0.989–1.011 мг/л Fe
267	0.977–1.023 мг/л Fe

См. *Раздел 3.4.3 Точность* для более подробной информации или в случае, если значение стандарта не укладывается в указанный диапазон.

Чувствительность

Программа	Участок кривой	ΔAbs	Δ Концентрации
265	Весь диапазон	0.010	0.022 мг/л Fe
267	Весь диапазон	0.010	0.023 мг/л Fe

См *Раздел 3.4.5 Чувствительность* для более подробной информации.

Сущность метода

Реактивы, входящие в состав реагента FerroVer преобразуют все растворимое железо и большую часть нерастворимого в двухвалентное железо. Железо (II) реагирует с 1,10-фенантролином с образованием соединения оранжевой окраски, интенсивность которой пропорциональна концентрации ионов железа. Измерение производится при 510 нм.

Необходимые реагенты

Описание	Необходимое к-во на тест	Единицы	Кат. №
FerroVer® пакетированные реагенты (для 10-мл образца)..... или	1 пакетик	100/упак	21057-69
FerroVer® ампулы AccuVac®	1 ампула	25/упак	25070-25

Необходимое оборудование

Измерительные кюветы, 10-мл, с крышкой.....	2	6/упак	24276-06
Стакан, 50-мл	1	шт.	500-41

Необходимые стандарты

Стандартный раствор железа, 100-мг/л	100 мл	14175-42
Стандартный раствор железа, 10-мл ампулы Voluette®, 50-мг/л Fe	16/упак	14254-10
Деионизованная вода	4 литра	272-56



Для оформления заказа, информации о ценах и технических консультаций:
ООО "ЭкоИнструмент" - официальный дистрибьютор HACH на территории РФ
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5/03 5ред.
IronTot_AVPP_Other_FVR_Eng_Ody.fm

КОПИЯ ВЕРНА

Директор К.А. Половников

9. Проводимость (0-199.9 мСим/см)

для воды, сточной воды

Метод прямого измерения (метод 8160)

1. Подготовьте кондуктометр CO150 к работе согласно инструкции по эксплуатации к данному прибору. CO150 автоматически выбирает подходящий диапазон измерений. **Замечание.** Если кондуктометрический датчик долгое время хранился, вымочите его перед использованием.
2. Погрузите датчик в мензурку с анализируемым раствором. Двигайте зонд вверх вниз, слегка постучите по стенкам мензурки для удаления пузырьков, которые могли образоваться на поверхности электрода. **Замечание.** Датчик должен быть погружен так, чтобы отверстия в его корпусе оказались под водой. **Замечание.** Кондуктометр CO150 автоматически компенсирует измерения к 20 или 25°C, в зависимости от установленной относительной температуры (S-2).
3. Убедитесь, что прибор находится в режиме COND и прочтите величину на дисплее. **Замечание.** Для проверки точности воспользуйтесь стандартом с известной проводимостью, поместив его на место образца (см. «Проверка точности»). **Замечание.** Если полученные Вами данные составляют менее 10% величины диапазона датчика, возможно необходимо использование другой (более чувствительной) кюветы. Если проводимость образца превосходит диапазон прибора, разбавьте образец, проведите измерения и рассчитайте проводимость. Инструкции по разбавлению включены в инструкцию по управлению и эксплуатации к CO150 (имейте в виду, что это не простое объемное разведение).
4. После каждого измерения промывайте датчик в деионизованной воде. **Замечание.** Для получения на дисплее данных в единицах TDS (общее содержание растворенных солей) нажимайте кнопку MODE, пока дисплей не перейдет в режим TDS. CO150 выдает значение TDS в мг/л хлорида натрия, вычисляя его из значения проводимости. С помощью CO150 также возможно измерение солёности. Солёность в данном случае является относительной шкалой, основанной на растворе хлорида калия. См. инструкцию по эксплуатации и управлению к CO150 для получения дополнительной информации.

Отбор и хранение проб

Собирайте пробы в чистые пластиковые или стеклянные бутылки. Заполняйте бутылки полностью и тщательно закрывайте пробками. Проанализируйте образцы так скоро, как только это возможно. Если нет возможности проводить анализ немедленно, пробы могут храниться в течение 24 часов при температуре 4°C (39°F) или ниже. Кондуктометр автоматически скомпенсирует измерения к 20 или 25°C.

Водные образцы, содержащие масла, растительные и животные жиры покрывают электрод пленкой, что влияет на точность результатов. Если наблюдается подобное явление, очистите датчик раствором сильного детергита, а затем тщательно ополосните деионизованной водой. Минеральные отложения могут быть удалены промыванием в растворе 1:1 соляной кислоты, как описано в методического руководства и управлению к CO150.

Перевод единиц

Следующая таблица демонстрирует перевод единиц проводимости в другие единицы измерения.



Для перевода ...	в ...	используйте данное соотношение
мСим/см	мкСим/см	мСим/см x 1000
мкСим/см	мСим/см	мкСим/см x 0.001
мкСим/см	μmhos/cm	мкСим/см x 1
мСим/см	mmhos/cm	мСим/см x 1
мкСим/см	мг/л TDS	мкСим/см x 0.5*
г/л TDS	мг/л TDS	г/л x 1000
мСим/см	г/л TDS	мСим/см x 0.5
мг/л TDS	г/л TDS	мг/л x 0.001
мг/л TDS	grg TDS	мг/л x 0.05842
г/л TDS	grg TDS	г/л x 58.42
мкСим/см	Ом·см	1.000.000÷мкСим/см
мСим/см	Ом·см	1.000.000÷мСим/см

*TDS - эмпирическая производная от величины проводимости. Коэффициент перевода 0.5 выбран из-за простоты и пригодности для различных типов вод. CO150 использует более сложный алгоритм для определения TDS, учитывающий дополнительные факторы, такие как температура.

Мешающие влияния

При измерении проводимости для получения более точных результатов должны соблюдаться следующие условия:

- Если измеряемая величина проводимости очень мала, предохраняйте образец от атмосферных газов (диоксид углерода, аммоний). Эти газы легко растворяются в воде и могут явиться причиной быстрого изменения проводимости. Для минимизации этого эффекта вскипятите образцы, а затем остудите в закрытых сосудах.
- Если образец содержит много гидроксидов (например, котельная вода), проведите нейтрализацию, чтобы предотвратить потерю точности из-за завышения результатов. Для нейтрализации добавьте четыре капли индикатора фенолфталеина на 50 мл образца, а затем добавляйте раствор галловой кислоты по каплям, пока розовая окраска полностью не исчезнет.

Проверка точности

Налейте стандартный раствор хлорида натрия (Sodium Chloride Standard Solution) с величиной проводимости, находящейся в том же диапазоне, что и величина проводимости образца, в мензурку. Проведите измерение проводимости, как описано выше. Если кондуктометр правильно откалиброван, полученная величина проводимости должна совпадать (в пределах доверительного интервала) с величиной, указанной на этикетке стандартного раствора. Калибровку можно проводить, используя этот же стандартный раствор (см. инструкцию по управлению и эксплуатации к CO150).

Основы метода

Электролитическая проводимость определяется способностью ионов в растворе переносить электрический заряд и является обратной величиной сопротивления раствора. Ток переносится растворенными неорганическими солями: анионами (например: хлорид, нитрат, сульфат, фосфат) и катионами (например: натрий, кальций, марганец, железо, алюминий). Органические вещества, такие как масла, фенолы, спирты, сахара, не могут быть хорошими



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переносчиками электрического тока и, таким образом, не могут обеспечивать проводимость, достаточную для оценки их концентрации.

Измерение проводимости осуществляется путем измерения сопротивления области исследуемого раствора, которая определяется конструкцией датчика. К двум электродам, погруженным в раствор, прикладывается фиксированное напряжение. Падение напряжения, вызванное сопротивлением раствора, служит для расчета удельной проводимости (проводимость на см раствора). Основная единица для измерения проводимости Сименс (S или mho), обратно пропорциональна Ом, используемому при измерении сопротивления. Поскольку диапазоны удельной проводимости для реальных водных растворов достаточно малы, наиболее часто используют следующие единицы измерения: миллиСименсы (10^{-3} Сим - мСим/см или mS/cm) или микроСименсы (10^{-6} Сим - мкСим/см или μ S/cm).

Необходимые реагенты и оборудование		
<i>Описание</i>	<i>Единицы</i>	<i>Номер по каталогу</i>
CO150 кондуктометр, портативный, с датчиком модели 50161	1	50150-00
Модели датчиков		
Модель 50160, константа кюветы 0.1, мин.диап 0.1 мкСим – 1000.000 мкСим, кабель 1м	1	50160-00
Модель 50161, константа кюветы 1.0, мин.диап 1.0 мкСим – 1000.000 мкСим, кабель 1м	1	50161-00
Модель 50162, константа кюветы 1.0, мин.диап 1.0 мкСим – 1000.000 мкСим, кабель 3м	1	50162-00
Необходимые реагенты и оборудование		
Батарея напряжения, 115 В	1	50070-00
Батарея напряжения, 230 В	1	50070-01
Мензурка, пластиковая, 100 мл	1	1080-42
Раствор галловой кислоты	50 мл SCDB	14423-26
Раствор соляной кислоты 1:1	500 мл	884-49
Принтер, модель 60, 115 В	1	50060-00
Принтер, модель 60 230 В	1	50060-01
Раствор стандартного раствора хлорида натрия, 1000 ± 10 мкСим/см, 500 ± 5 мг/л TDS	100 мл	14400-42
Раствор стандартного раствора хлорида натрия, 1990 ± 20 мкСим/см, 995 ± 10 мг/л TDS	100 мл	2105-42
Раствор стандартного раствора хлорида натрия, 18000 ± 50 мкСим/см, 9000 ± 25 мг/л TDS	100 мл	23074-42
Раствор стандартного раствора хлорида натрия, 180 ± 10 мкСим/см, 90 ± 1 мг/л TDS	100 мл	23075-42
Промывалка на 125 мл	1	620-14
Деионизованная вода	4 л	272-56

*За дополнительной информацией обращайтесь в компанию ЭКОИНСТРУМЕНТ.



* Адаптированная методика из сборника "Стандартные методы анализа обычных и сточных вод".



Замечания и рекомендации

- Для определения общего алюминия необходимо предварительное разложение пробы. См. Раздел 4 для выбора необходимой процедуры.
- Для получения точных результатов температура образца должна быть между 20–25 °C (68–77 °F).
- Для удаления загрязнений всю стеклянную посуду следует промыть 6.0 N HCl и деионизированной водой.
- После добавления реагента AluVer® 3 в присутствии ионов алюминия разовьется оранжево-красная окраска.
- Перед каждым помещением в кюветное отделение прибора протирайте внешние стенки измерительных кювет. Для удаления отпечатков пальцев и других загрязнений используйте сначала влажную, а затем сухую салфетку.
- Сразу после завершения анализа промойте градуированный цилиндр и измерительную кювету ершиком и мылом.



Пакетированные реагенты

Метод 8012



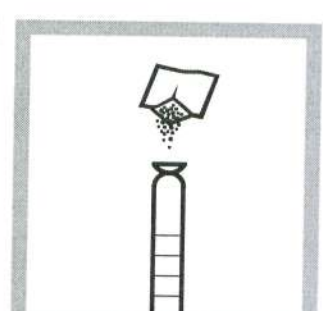
1. Нажмите Hach Programs.
Выберите программу **10 Aluminum, Alumin.**
Нажмите **Start**.



2. Наполните цилиндр до отметки 50-мл анализируемым образцом.



3. Добавьте содержимое одного пакетика с аскорбиновой кислотой. Закройте пробкой и несколько раз переверните для растворения порошка.



4. Добавьте содержимое одного пакетика с реагентом AluVer 3. Закройте цилиндр пробкой.



Алюминий

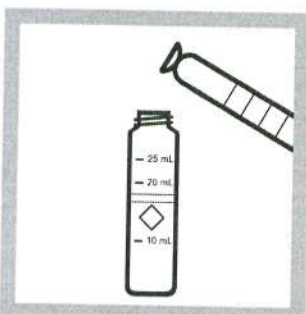


5. Нажмите на изображение таймера.

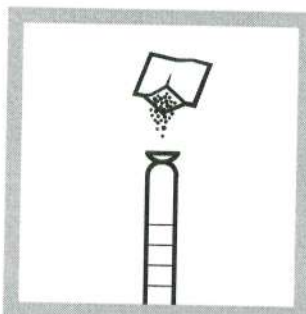
Нажмите ОК.

Быстро переворачивайте цилиндр в течение одной минуты.

Необходимо, чтобы весь порошок растворился, иначе, полученные результаты могут быть неверны.

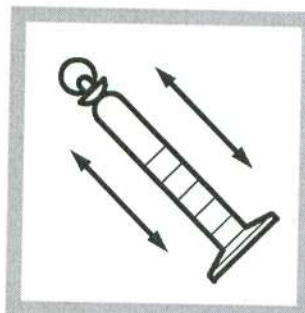


6. Перелейте 25 мл смеси в измерительную кювету объемом 25-мл. (Это подготовленный образец).



7. К оставшимся в градуированном цилиндре 25 мл смеси добавьте содержимое одного пакетика с реагентом Bleaching 3 (отбеливателем).

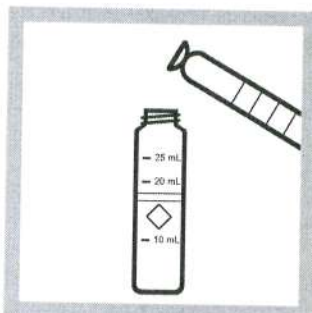
Закройте цилиндр пробкой.



8. Нажмите на изображение таймера.

Нажмите ОК

В течение 30 секунд интенсивно потрясите (раствор должен стать от светло-оранжевого до оранжевого цвета).



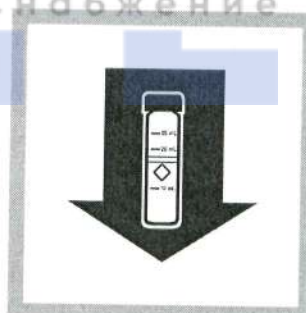
9. Перелейте 25 мл раствора во вторую измерительную кювету объемом 25-мл (это нулевой раствор).



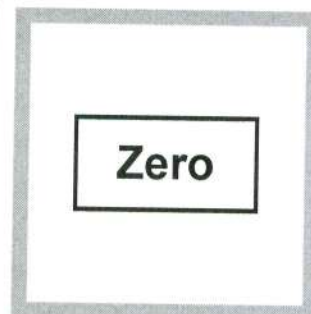
10. Нажмите на изображение таймера.

Нажмите ОК.

Начнется отсчет 15-минутного интервала, необходимого для протекания реакции.



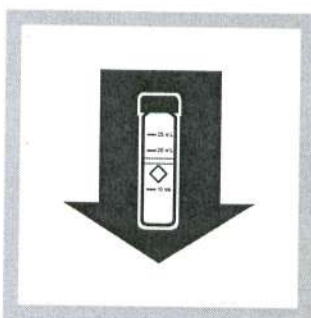
11. В течение 5 минут после сигнала таймера, протрите стенки кюветы с нулевым раствором и поместите ее в кюветодержатель прибора.



12. Нажмите Zero.

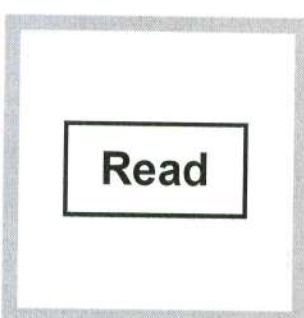
На дисплее появится:

0.000 mg/L Al³⁺



13. Сразу после этого протрите кювету с подготовленным образцом и также поместите ее в кюветодержатель прибора.

На дисплее появится результат в мг/л Al^{3+} .



14. Для DR/2400:

Нажмите Read.

На дисплее появится результат в мг/л Al^{3+} .

Мешающие влияния

Мешающее вещество	Уровень мешающего влияния
Кислотность	<p>Больше чем 300 мг/л как $CaCO_3$. Для образцов с кислотностью свыше 300 мг/л необходима следующая пробоподготовка:</p> <p>а) Добавьте одну каплю раствора индикатора <i>m</i>-нитрофенола (Кат. № 2476-32) к образцу, полученному на <i>шаге</i> 3.</p> <p>б) Добавьте одну каплю 5.0 N раствора гидроксида натрия (Кат. № 2450-26). Закройте пробкой и несколько раз переверните цилиндр. Повторяйте эту процедуру до тех пор, окраска не сменится с бесцветной на желтую.</p> <p>с) Добавьте одну каплю 5.25 N раствора серной кислоты (Кат. № 2449-32) для обесцвечивания образца. Продолжите выполнение методики.</p>
Щелочность	<p>1000 мг/л как $CaCO_3$. Устранить мешающее влияние высокой щелочности можно следующим образом:</p> <p>а) Добавьте одну каплю раствора индикатора <i>m</i>-нитрофенола (Кат. № 2476-32) к образцу, полученному на <i>шаге</i> 3. Желтая окраска раствора свидетельствует о высокой щелочности.</p> <p>б) Добавьте одну каплю 5.25 N раствора серной кислоты (Кат. № 2449-32). Закройте пробкой и несколько раз переверните цилиндр. Повторяйте эту процедуру до тех пор, окраска не сменится с желтой на бесцветную. Продолжите выполнение методики.</p>
Фторид	Оказывает мешающее влияние при любом содержании. См. ниже приведенный график.
Железо	Больше чем 20 мг/л
Фосфат	Больше чем 50 мг/л
Полифосфаты	Полифосфаты оказывают мешающее влияние при любом содержании, приводя к занижению результатов. Для устранения их влияния все полифосфаты перед анализом следует перевести в ортофосфат при помощи кислотного гидролиза, как это описано в методике определения фосфора.



Алюминий
Стр. 27 из 30

Алюминий

Поскольку фторид образует с алюминием комплексное соединение, он оказывает мешающее влияние при любом содержании. Если известна концентрация фторида, истинную концентрацию алюминия можно рассчитать по графику мешающего влияния фторида:

1. Выберите вертикальную ось на верхней части графика, соответствующую концентрации алюминия, полученной на шаге 13 (14).
2. Определите ее точку пересечения с горизонтальной осью, соответствующей содержанию фторида в образце.
3. Экстраполируйте истинную концентрацию алюминия по кривым проходящей с каждой стороны от точки пересечения; значения истинных концентраций, соответствующие кривым приведены до нижней оси графика.

Например, если в результате анализа получено значение 0.7 мг/л Al и концентрация фторида в образце при этом составляла 1 мг/л F⁻, точка пересечения соответствующих осей находится между кривыми 1.2 и 1.3 мг/л Al. В данном случае путем экстраполяции получаем, что истинная концентрация алюминия составляет 1.27 мг/л.

Figure 1 График учета мешающего влияния фторида



Отбор, хранение и консервирование пробы

Отбирайте образцы в чистые стеклянные или пластиковые контейнеры. Для консервации образцов доведите pH пробы до 2 или меньше при помощи азотной кислоты (Кат. № 152-49) (примерно 1.5 мл на литр). Законсервированные образцы могут храниться до шести месяцев при комнатной температуре. Перед анализом нейтрализуйте пробу до pH 3.5–4.5 при помощи 5.0 N раствора гидроксида натрия (Кат. № 2450-26). Скорректируйте полученные результаты в соответствии с добавленными объемами; см. *Раздел 3.1.3 Расчет поправки на добавленные объемы*.



Проверка правильности

Метод стандартных добавок

1. После получения результата анализа, оставьте кювету с образцом (образец без добавки) в кюветном отделении прибора.
2. Нажмите **Options**. Нажмите **Standard Additions**. На дисплее появится краткая информация о методе добавок.
3. Нажмите **OK** для подтверждения принятых по умолчанию значений концентрации стандарта, объема образца и объема добавки. Для изменения этих значений нажмите **Edit**. После подтверждения параметров метода в верхней строке появится значение для образца без добавки. См. *Метод стандартных добавок* в инструкции к спектрофотометру Odyssey для дополнительной информации.
4. Вскройте ампулу Voluette® со стандартным раствором 50-мг/л Al.
5. Приготовьте образцы с добавками. Для этого наполните три цилиндра для перемешивания (Кат. № 1896-41) 50 мл образца и используя пипетку TenSette® добавьте в каждый цилиндр по 0.1 мл, 0.2 мл и 0.3 мл стандарта соответственно. Тщательно перемешайте.
6. Проанализируйте все образцы с добавками, как описано выше, начиная с добавки в 0.1 мл. Подтверждайте каждое полученное значение клавишей **Read**. Каждая добавка должна давать примерно 100% выход.
7. После окончания измерения серии, нажмите **Graph** для просмотра аппроксимирующей прямой, проходящей через точки стандартных добавок с учетом мешающего влияния матрицы. Для того, чтобы увидеть соотношение между реальной и "идеальной прямой", соответствующей 100% выходу по каждой добавке, нажмите **View: Fit**, затем выберите **Ideal Line** и нажмите **OK**.

См. *Раздел 3.2.2 Стандартные добавки* для подробной информации.

Метод стандартного раствора

Приготовьте стандартный раствор 0.4-мг/л Al одним из двух способов:

1. Отберите пипеткой 1.00 мл стандартного раствора концентрацией 100-мг/л Al³⁺ в мерную колбу на 250-мл и доведите до метки деионизированной водой. Закройте пробкой и перемешайте. Готовьте раствор ежедневно. Проведите анализ по вышеприведенной схеме.

или

1. Отберите пипеткой TenSette 0.80 мл стандартного раствора из ампулы Voluette® (50-мг/л Al³⁺) в мерную колбу на 100-мл и доведите до метки деионизированной водой. Закройте пробкой и перемешайте. Готовьте раствор ежедневно. Проведите анализ по вышеприведенной схеме.
2. Для настройки калибровочной кривой с использованием значения, полученного при измерении стандартного раствора 1.00-мг/л, в меню текущей программы нажмите **Options**. Нажмите **Standard Adjust**.
3. Выберите **On**. Нажмите **Adjust** для подтверждения отображаемой концентрации. Если используется стандарт с другой концентрацией, введите его значение и нажмите **OK**. Нажмите **Adjust**.

См. *Раздел 3.2.5 Настройка калибровочной кривой* для доп. информации.

Алюминий

Метрологические характеристики метода

Правильность

Стандарт 0.40 мг/л Al³⁺

Программа	Доверительный интервал 95%
10	0.383–0.417 мг/л Al ³⁺

См. Раздел 3.4.3 Точность для более подробной информации или в случае, если значение стандарта не укладывается в указанный диапазон.

Чувствительность

Участок калиб. кривой	ΔAbs	ΔКонцентрации
Весь диапазон	0.010	0.008 мг/л Al ³⁺

См. Раздел 3.4.5 Чувствительность для более подробной информации.

Сущность метода

Индикатор алюминон образует с алюминием соединение оранжево-красной окраски. Интенсивность окраски пропорциональна концентрации алюминия. Добавки аскорбиновой кислоты необходима для маскирования железа. Пакетированный реагент AluVer 3 демонстрирует исключительную стабильность и применим для анализа пресных вод. Измерения оптической плотности производятся при 522 нм.

Необходимые реагенты

Описания	Необходимое к-во на тест	Единицы	Кат. №
Набор реагентов для определения алюминия (на 100 тестов) Включает:			22420-00
(1) AluVer® 3 Aluminum, пакетированные реагенты	1 пакетик	100/упак.	14290-99
(1) Аскорбиновая кислота, пакетированные реагенты	1 пакетик	100/упак.	14577-99
(1) Bleaching 3 (отбеливатель), пакетированные реагенты	1 пакетик	100/упак.	14294-49
Соляная кислота, 6.0 N	разное	500 мл	884-49
Деионизированная вода	разное	4 литра	272-56

Необходимое оборудование

Цилиндр, мерный для перемешивания, 50-мл, с пробкой	1	шт.	1896-41
Кюветы измерительные, 10-20-25 мл	2	6/упак.	24019-06

Необходимые стандарты

Стандартный раствор алюминия, 100-мг/л Al ³⁺	100 мл	14174-42
Стандартный раствор алюминия, 10-мл Voluette® ампула, 50-мг/л Al	16/упак.	14792-10
Раствор азотной кислоты, 1:1	500 мл	2540-49
Деионизированная вода	4 литра	272-56



Для оформления заказа, информации о ценах и технических консультациях:
ООО "ЭкоИнструмент" - официальный дистрибьютор HACH на территории РФ
119899 Москва Ленинские горы МГУ
т./ф. (095) 745-2290, 745-2291

HACH Company
WORLD HEADQUARTERS
Telephone: (970) 669-3050
FAX: (970) 669-2932

39. Алюминий (от 0 до 0.80 мг/л Al)

для воды, сточной воды

Алюминонный метод (метод 8012)

1. Введите номер заложенной программы для определения алюминия. Нажмите: 10 ENTER. На дисплее появится: DIAL nm to 522. **Замечание.** В этом методе может быть использована проточная кювета, если ее хорошо промыть деионизованной водой между измерением бланка и образца.
2. Поворачивайте ручку установки длины волны, пока на дисплее не появится: 522 nm. Когда правильная длина волны будет установлена, на дисплее на некоторое время появится: ZERO SAMPLE, а затем: mg/L Al³⁺. **Замечание.** Для определения общего алюминия образцы необходимо предварительно разложить.
3. Наполните 50-мл градуированный цилиндр для перемешивания образцом до отметки 50мл. **Замечание.** Для получения правильных данных температура образца должна быть 20-25°C.
4. Добавьте содержимое одной подушечки с аскорбиновой кислотой. Закройте цилиндр пробкой и перемешайте содержимое для растворения порошка.
5. Добавьте содержимое одной подушечки с реагентом AluVer 3. Закройте цилиндр пробкой и перемешивайте в течение примерно одной минуты содержимое для растворения реагента. **Замечание.** В присутствии алюминия разовьется красно-оранжевая окраска. **Замечание.** Если часть порошка не растворилась, могут быть получены неправильные результаты.
6. Перелейте 25 мл смеси в 25-мл кювету (подготовленный образец).
7. В оставшиеся в цилиндре 25 мл добавьте содержимое одной подушечки с реагентом Bleaching 3, закройте и перемешивайте содержимое цилиндра в течение 30 секунд. **Замечание.** Раствор должен стать светло-оранжевым, но не обесцветится полностью.
8. Наполните другую 25 мл кювету полученной смесью (холостой раствор).
9. Нажмите: SHIFT TIMER. Начнется отсчет 15-минутного периода, необходимого для протекания реакции. Когда прозвучит звуковой сигнал (отсчет времени закончен), на дисплее появится: mg/L Al³⁺.
10. В течение 5 минут после сигнала поместите кювету с холостым раствором в кюветодержатель и закройте светозащитную крышку.
11. Нажмите: ZERO. На дисплее появится: ZEROING..., затем 0.00 mg/L Al³⁺
12. Сразу же поместите подготовленный образец в кюветодержатель и закройте светозащитную крышку.
13. Нажмите: READ. На дисплее появится: READING..., затем результаты в мг/л алюминия. Возможные химические формы: Al³⁺, Al₂O₃. **Замечание.** Очистите градуированный цилиндр и кювету мылом и щеткой сразу после проведения анализа. **Замечание.** Для получения точных результатов, для каждой партии реагентов проводите анализ деионизованной воды и вычитайте полученный результат из всех определений, проведенных с этой партией реагента.

Отбор и хранение проб

Отбирайте пробы в чистые пластиковые или стеклянные бутылки. Консервируйте доведением pH до 2 или ниже с помощью азотной кислоты (примерно 1.5 мл на 1 л). Законсервированные образцы могут храниться до 6 месяцев при комнатной температуре. Перед началом анализа доведите pH до 3.5-4.5 с помощью 5N NaOH. Скорректируйте результаты в соответствии с добавленными объемами.

Проверка точности**Метод добавок**

- Вскройте ампулу со стандартным раствором алюминия 50 мг/л.
- Используя пипетку, добавьте 0,1, 0,2 и 0,3 мл стандартного раствора в три свежих образца объемом 50 мл. Хорошо перемешайте.
- Проанализируйте каждый образец, как описано выше. Концентрация алюминия должна возрастать на 0,1 мг/л на каждый 0,1 мл добавленного стандарта.
- В случае, если данная зависимость не соблюдается, обратитесь к главе «Стандартные добавки» в разделе I.

Метод стандартного раствора

Приготовьте стандартный раствор 0,4 мг/л алюминия. Для этого отберите пипеткой 1 мл стандартного раствора с концентрацией 100 мг/л Al в мерную колбу на 250 мл и доведите до метки деионизованной водой. Готовьте раствор непосредственно перед использованием. Используйте данный раствор вместо образца для анализа на хлорид. Результат должен составлять 0,4 мг/л Al.

Или отберите пипеткой 0,8 мл стандартного раствора из ампулы с концентрацией 50 мг/л Al в мерную колбу на 100 мл и доведите до метки деионизованной водой. Готовьте этот раствор непосредственно перед использованием.

Точность

В одной лаборатории на спектрофотометре DR/2010 при анализе с использованием стандартных растворов с концентрацией 0,2 мг/л алюминия и двух реагентов из разных партий, один лаборант получил стандартное отклонение, равное ± 0.016 мг/л Al.

Мешающие влияния

Следующие показатели не оказывают мешающего влияния, при концентрации ниже указанных:

Щелочность	1000 мг/л по CaCO ₃
Железо	20 мг/л
Фосфат	50 мг/л

Влияние высокой щелочности можно устранить следующей пробоподготовкой:

- Добавить одну каплю раствора индикатора м-Нитрофенола к образцу на шаге 3. Желтая окраска свидетельствует о повышенной щелочности.
- Добавить одну каплю 5.25N стандартного раствора серной кислоты. Закрыть цилиндр пробкой и перемешать. Если желтая окраска не исчезнет, добавьте еще одну каплю кислоты. Повторяйте до обесцвечивания раствора.

Полифосфаты в любой концентрации занижают результаты и должны отсутствовать. Перед проведением анализа полифосфаты должны быть переведены в ортофосфат кислотным гидролизом, как описано в методике на фосфор.

Кислотность оказывает мешающее влияние при уровне выше 300 мг/л по CaCO₃. Образцы с повышенной кислотностью необходимо обработать следующим образом:

- Добавить одну каплю раствора индикатора м-Нитрофенола к образцу на шаге 3.

- b. Добавить одну каплю 5N раствора NaOH. Закрывать цилиндр пробкой и перемешать. Если желтая окраска не появится, добавьте еще одну каплю щелочи. Повторяйте появления желтой окраски.
- c. Добавить одну каплю 5.25N стандартного раствора серной кислоты. Закрывать цилиндр пробкой и перемешать. Если желтая окраска не исчезнет, добавьте еще одну каплю кислоты. Повторяйте до обесцвечивания раствора.

Кальций не оказывает мешающего влияния.

Фторид в любых концентрациях занижает результаты, образуя с алюминием прочный комплекс. Реальная концентрация алюминия может быть получена из таблицы «Влияние фторида» при условии, что известна концентрация фторид-иона. Используйте таблицу следующим образом:

1. По верхней шкале выберите вертикаль, соответствующую показаниям прибора.
2. Определите точку, где выбранная вертикаль пересекается с горизонталью, соответствующей концентрации фторида.
3. Рассчитайте реальное содержание алюминия путем экстраполяции по вертикали двух кривых, между которыми находится определенная Вами точка.

Например, если в результате эксперимента получено, что содержание алюминия равно 0.7 мг/л при содержании фторид 1.0 мг/л, то точка, где пересекаются соответствующая вертикаль и горизонталь находится между кривыми 1.2 и 1.3 мг/л Al. Путем простой экстраполяции получим, что примерное содержание алюминия равно 1.27 мг/л.

Основа метода.

Индикатор алюмининон реагирует с алюминием с образованием соединения красно-оранжевой окраски, интенсивность которой прямо пропорциональна содержанию алюминия. Аскорбиновая кислота добавляется для устранения влияния железа. Реагент AluVer 3 упакованный в подушечки в виде порошка обладает исключительной стабильностью и применим для свежих водных образцов.



КОПИЯ ВЕРНА

Директор К.А. Половников

Необходимые реагенты			
Набор реактивов для определения алюминия (на 100 тестов) Включает: (4) 14290-46, (1) 14577-99, (1) 14294-46			22420-00
Описание	на тест	единицы	№ по кат
AluVer 3, реагент на алюминий в подушечках	1 под.	25 в уп.	14290-46
Аскорбиновая кислота в подушечках	1 под.	100 в уп.	14577-99
Bleaching 3 реагент в подушечках	1 под.	100 в уп.	14294-49
Необходимое оборудование			
Цилиндр градуированный 50 мл для перемешивания	1	1	1896-41
Измерительные кюветы на 25-мл, парные	2	пара	20950-00
Дополнительные реагенты			
Стандартный раствор 100 мг/л алюминия		100 мл	14174-42
Стандартный раствор 50мг/л алюминия в ампуле Voluette, 10мл		16 в уп.	14792-10
Раствор соляной кислоты 6N (1:1)		500 мл	884-49
Индикатор м-Нитрофенол, раствор 10г/л		100 мл	2476-32
Азотная кислота, класс ACS		500 мл	152-49
Азотная кислота, раствор 1:1		500 мл	2540-49
Стандартный раствор NaOH, 5N		100 мл	2450-32
Стандартный раствор NaOH, 5N		50 мл	2450-26
Стандартный раствор серной кислоты, 5.25N		100 мл	2449-32
Вода деионизованная		4 л	272-56
Дополнительное оборудование			
Ампуловскрываетель	1		21968-00
Щетка	1		690-00
Колба, мерная на 100 мл	1		547-42
Колба, мерная на 250 мл	1		547-46
Комбинированный фторид-селективный электрод	1		50265-00
Индикаторная бумага, pH 1 до 11 pH		5 рулонов	391-33
pH-ионо метр, ЕС 20, портативный	1		50075-00
Пипетка TENSETTE, 0.1 –1.0 мл	1		19700-01
Наконечники на пипетку TENSETTE 19700-01	50		21856-96
Проточная кювета в сборе	1		45215-00
Термометр, -20 .. +105°C	1		1877-01

*За дополнительной информацией обращайтесь в компанию ЭКОИНСТРУМЕНТ.



12. Жесткость кальциевая (10–4000 мг/л CaCO₃)

для воды, сточной воды, морской воды

С использованием ЭДТА и цифрового титратора (метод 8204)

1. Выберите объем анализируемой пробы и картридж с ЭДТА, необходимые для проведения титрования и соответствующие ожидаемой концентрации карбоната кальция (см. табл. 1). **Замечание.** Если образец не может быть проанализирован немедленно, добавьте к нему 1.5 мл азотной кислоты на каждый литр образца для консервации последнего и предотвращения адсорбции кальция стенками контейнера. Храните пробы в холодильнике. Образцы, законсервированные таким образом, устойчивы в течение недели. Перед началом анализа проведите нейтрализацию до pH 7.
2. Вставьте чистую подающую трубку в картридж для титрования, укрепите картридж в титраторе. См. «Общее описание» и описание «по шагам» для цифрового титратора для получения более общих инструкций, если это необходимо.
3. Поворачивайте подающий винт титратора до тех пор, пока на кончике трубки не появится несколько капель титранта. Обнулите показания и промокните кончик подающей трубки. **Замечание.** Для дополнительного удобства используйте магнитную мешалку, например TitraStir (см. «Общее описание» и «п.3» в описании «по шагам» для цифрового титратора).
4. Используйте градуированный цилиндр или пипетку для отбора аликвоты образца, согласно табл.1. Перенесите образец в чистую эрленмейеровскую колбу на 250 мл (коническая отградуированная колба). Доведите объем до 100-мл деионизованной водой, если это необходимо.
5. Добавьте 2 мл 8N стандартного раствора гидроксида калия и перемешайте круговыми движениями. **Замечание.** Если объем образца 50 мл и менее, можно добавить 1 мл. **Замечание.** Магний не включается в результаты, однако должен присутствовать для более четкого перехода в конечной точке титрования. Если известно, что магний отсутствует, добавьте одну или две капли стандартного раствора 10 г/л магния по CaCO₃.
6. Добавьте к содержимому порошок-индикатор на кальций из одной подушечки CalVer 2 и перемешайте круговыми движениями. **Замечание.** На этом шаге можно заменить подушечку с индикатором на 0.1-граммовый шпатель с порошком CalVer 2.
7. Поместите кончик подготовленной на шаге1-3 подающей трубки в раствор и, перемешивая круговыми движениями, титруйте ЭДТА, пока розовая окраска не изменится на голубую. Запишите показания титратора. **Замечание.** Вблизи конечной точки титруйте медленно, поскольку скорость реакции мала, особенно в холодных образцах.
8. Вычисления проводят по следующей формуле: Показания титратора x Числовой коэффициент (табл. 1) = мг/л CaCO₃ жесткости по кальцию.

Таблица 1

Диапазон (мг/л CaCO ₃)	Объем образца (мл)	Картридж для титрования (М ЭДТА)	Номер по каталогу	Числовой множитель
10-40	100	0.0800	14364-01	0.1
40-160	25	0.0800	14364-01	0.4
100-400	100	0.800	14399-01	1.0
200-800	50	0.800	14399-01	2.0
500-2000	20	0.800	14399-01	5.0
1000-4000	10	0.800	14399-01	10.0

Взаимосвязь между единицами жесткости.

мг/л Ca = Ca жесткость, мг/л по CaCO₃ × 0.40

ммоль/л = Ca жесткость, мг/л по CaCO₃ × 0.01

Контроль точности**Метод стандартных добавок**

Тест на точность проводится, если предполагаются мешающие влияния

1. Отколите горлышко у ампулы стандарта для жесткости 10.000 мг/л по CaCO₃.
2. С помощью пипетки отберите 0.1 мл стандарта и добавьте к образцу, титруемому на 7-ом шаге. Возобновите титрование до достижения конечной точки. Запомните количество мл титранта, ушедшего на «дотитрование».
3. Повторите операцию два или более раз, каждый раз прибавляя по 0.1 мл и титруя до конечной точки.
4. Каждое прибавление 0.1 мл стандарта должно требовать на дотитрование 10 дополнительных единиц 0.800 N титранта или 100 единиц 0.0800 N (11 единиц 0.714 M или 56 единиц 0.1428 M титранта). Если данная зависимость не соблюдается см. «Дополнение А, Проверка точности. Метод стандартных добавок» в руководстве к цифровому титратору.

Мешающие влияния**Осторожно!**

Цианистый калий крайне токсичен! Всегда добавляйте его в раствор только после гидроксида калия. Избыток цианида калия не влияет на результаты. Все цианидные отходы должны быть обработаны избытком сильно щелочного раствора гипохлорита натрия (отбеливатель) при перемешивании. Работайте в помещениях с хорошей вентиляцией. Утилизацию следует проводить спустя 24 часа после обработки.

- Некоторые переходные и тяжелые металлы способны к комплексообразованию с индикатором и маскируют цветовой переход в конечной точке титрования. Добавление 0.5-г шпателя цианида калия после добавления гидроксида калия маскирует мешающее влияние для следующих металлов, в указанных количествах (в неразбавленном 100 мл образце):

Таблица 2.

Метал	Максимально допустимый уровень* в присутствии KCN	Максимально допустимый уровень* в отсутствие KCN
кобальт	20 мг/л	нет
медь	100 мг/л	0.10 мг/л
никель	200 мг/л	0.5 мг/л
цинк	100 мг/л	5 мг/л

*В пробах меньшего объема концентрации этих элементов, не оказывающих мешающего влияния, пропорционально выше, т.к. их влияние уменьшается в результате доведения объема пробы до 100 мл. Поскольку объемы образцов в табл. 1 от 10 до 100 мл, концентрация мешающих веществ может быть выше указанных и не оказывать влияния на результаты измерения в виду разбавления проб.

- В неразбавленных образцах железо оказывает мешающее влияние при содержании свыше 8 мг/л. При содержании выше указанного значения, железо вызывает переход окраски от красно-оранжевой до зеленой в конечной точке титрования. Этот переход остается достаточно четким вплоть



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до 20 мг/л, и его можно использовать для фиксации конечной точки титрования.

- Марганец оказывает мешающее влияние при содержании свыше 5 мг/л.
- Алюминий замедляет переход окраски в конечной точке титрования, однако содержание до 200 мг/л является допустимым при достаточном времени для развития окраски.
- Поскольку при высоких значениях pH начинается выпадение гидроксида магния, он не оказывает мешающего влияния при концентрации менее 200 мг/л. Однако более высокое содержание магния мешает четкому переходу в конечной точке титрования.
- Ортофосфат замедляет переход окраски в конечной точке титрования, но не оказывает мешающего влияния, если имеется достаточное время для повторного растворения образующегося в процессе титрования фосфата кальция. Для получения точных результатов в пробе не должно быть полифосфатов.
- Барий и стронций оттитровываются вместе с кальцием, однако редко присутствуют в природных водах в ощутимых количествах.
- Кислотность и щелочность до 10.000 мг/л по карбонату кальция не оказывают мешающего влияния на результаты определения.
- Насыщенный раствор хлорида натрия мешает получению четкого перехода в конечной точке титрования, однако морскую воду можно титровать напрямую.
- Образцы при температуре около или ниже 20°C (68°F) должны титроваться медленно вблизи конечной точки титрования, чтобы дать достаточно времени для изменения окраски.
- Образцы, имеющие высокие значения pH или высокую буферную емкость, могут превосходить буферную емкость реагентов и требуют предварительной обработки; см. «Мешающее влияние, pH» в разделе I методического руководства для спектрофотометра DR/2010.

Основы метода

pH образца доводят до 12-13 для осаждения магния в виде гидроксида. Индикатор CalVer2 вступает в реакцию с кальцием с образованием соединения с красно-розовой окраской. По мере прибавления ЭДТА она реагирует со свободными ионами кальция. Когда свободных ионов кальция не останется, ЭДТА начинает взаимодействовать с кальцием, входящим в состав комплекса с индикатором, что служит причиной перехода окраски из розовой в голубую.

Необходимые реагенты		
Набор реагентов для определения кальциевой жесткости (100 тестов):		
10-160 мг/л включает: (1) 282-32, (1) 852-99, (1) 14364-01		24472-00
100-4.000 мг/л включает: (1) 282-32, (1) 852-99, (1) 14399-01		24475-00
Описание	Единицы	Номер по каталогу
Подушечки CalVer 2	100 в упаковке	852-99
Стандартный раствор гидроксида калия, 8.00 N	100 мл*	282-32
Дистиллированная вода	4 л	272-56
Выбирается один или несколько, в зависимости от концентрации		
Картридж для титрования с ЭДТА, 0.0800 M	1	14364-01
Картридж для титрования с ЭДТА, 0.1428 M	1	14960-01

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Жесткость кальциевая (10-4000 мг/л CaCO₃)

Картридж для титрования с ЭДТА, 0.714 М	1	14959-01
Картридж для титрования с ЭДТА, 0.800 М	1	14399-01
Необходимое оборудование		
Ножницы для открывания подушечек	1	968-00
Цифровой титратор	1	16900-01
Колба эрленмеера, 250 мл	1	505-46
Выбирается один или несколько в зависимости от концентрации		
Градуированный цилиндр, 10 мл	1	508-38
Градуированный цилиндр, 25 мл	1	508-40
Градуированный цилиндр, 50 мл	1	508-41
Градуированный цилиндр, 100 мл	1	508-42
Дополнительные реагенты		
Набор реагентов для определения общей жесткости (на 100 тестов) Включает: (2) 282-32, (1) 424-32, (1) 851-49, (1) 14364-01, (1) 14399-01, (1) 947-49		22721-00
Стандартный раствор хлорида кальция, 1000 мг/л CaCO ₃	1000 мл	121-53
Cal Ver 2 порошок индикатора на кальций	113 г	281-14
Стандартный раствор кальция, в ампулах, 10.000 мг/л CaCO ₃ , 10 мл	16 в упаковке	2187-10
Стандартный раствор магния, 10 г/л по CaCO ₃	29 мл SCDB	1022-33
Азотная кислота, ACS	500мл	152-49
Раствор азотной кислоты, 1:1	500 мл	2540-49
Цианид калия, ACS	125 г	767-14
Дополнительное оборудование		
Промывалка, пластик, 500мл	1	620-11
Зажим, двухзубчиковый, 38 мм	1	21145-00
Зажим-держатель	1	326-00
Деминерализирующий комплект, 473 мл	1	21846-00
Подающая трубка с загнутым на 180° концом	5 в упаковке	17205-00
Подающая трубка с загнутым на 90° концом	5 в упаковке	41578-00
pH-метр ЕС 10, портативный	1	50050-00
pH индикаторная бумага 1.0 - 11 pH	5 катушек	391-33
Пипетка TENSETTE, от 0.1 до 1.0 мл	1	19700-01
Наконечники для пипетки TENSETTE 19700-01	50 в упаковке	21856-96
Пипетка, класс А, 10 мл	1	14515-38
Пипетка, класс А, 20 мл	1	14515-20
Пипетка, класс А, 25 мл	1	14515-40
Пипетка, класс А, 50 мл	1	14515-41
Пипетка, класс А, 100 мл	1	14515-42
Устройство для наполнения пипеток, «груша»	1	14651-00
Шпатель, на 0.1 г	1	511-00
Шпатель, на 0.5 г	1	907-00
Кольцевой штатив	1	563-00
Мешалка TITRASTIR/монтажный стенд, 115 В	1	19400-00
Мешалка TITRASTIR/монтажный стенд, 230 В	1	19400-10

*За дополнительной информацией обращайтесь в компанию ЭКОИНСТРУМЕНТ.



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Директор К.А. Половников

13. Жесткость общая (10-4000 мг/л CaCO₃)

для воды, сточной воды, морской воды

С использованием ЭДТА и цифрового титратора (метод 8213)

1. Выберите объем анализируемой пробы и картридж с ЭДТА, необходимые для проведения титрования и соответствующие ожидаемой концентрации карбоната кальция (см. табл. 1). *Замечание. Отберите не менее 100 мл образца в стеклянный или полиэтиленовый контейнер. Образцы могут храниться в течение семи дней после пробоотбора, при температуре 4°C, подкисленными концентрированной азотной кислотой до pH 2. Перед началом анализа проведите нейтрализацию до pH 7 раствором гидроксида аммония.*
2. Вставьте чистую подающую трубку в картридж для титрования, укрепите картридж в титраторе (см. "Общее описание" и описание "по шагам" для цифрового титратора для получения более общих инструкций, если это необходимо).
3. Поворачивайте подающий винт титратора до тех пор, пока на кончике трубки не появится несколько капель титранта. Обнулите показания и промокните кончик подающей трубки. *Замечание. Для дополнительного удобства используйте магнитную мешалку, например TitraStir (см. «Общее описание» и «п.3» в описании «по шагам» для цифрового титратора).*
4. Используйте градуированный цилиндр или пипетку для отбора аликвоты образца, согласно табл.1. Перенесите образец в чистую эрленмейеровскую колбу на 250 мл (коническая градуированная колба). Доведите объем до 100-мл деионизованной водой, если это необходимо.
5. Добавьте 2 мл буферного раствора для определения жесткости (Buffer solution, Hardness, 1) и перемешайте круговыми движениями.
6. Добавьте к содержимому порошок-индикатор на общую жесткость из одной подушечки ManVer 2 и перемешайте круговыми движениями. *Замечание. На этом шаге можно заменить подушечку с индикатором на 0.1-граммовый шпатель с порошком ManVer 2 или 4-мя каплями раствора ManVer.*
9. Поместите кончик подготовленной на шаге 1-3 подающей трубки в раствор и, перемешивая круговыми движениями, титруйте ЭДТА, пока красная окраска не изменится на чисто голубую. Запишите показания титратора. *Замечание. Вблизи конечной точки титруйте медленно, поскольку скорость реакции мала, особенно в холодных образцах.*
7. Вычисления проводят по следующей формуле: Показания титратора x Числовой коэффициент (табл. 1) = мг/л CaCO₃ общей жесткости. *Замечание. Концентрацию магния можно вычислить, вычтя из результата по общей жесткости результат для жесткости по кальцию.*

Таблица 1

Диапазон (мг/л CaCO ₃)	Объем образца (мл)	Картридж для титрования (М ЭДТА)	Номер по каталогу	Числовой множитель
10-40	100	0.0800	14364-01	0.1
40-160	25	0.0800	14364-01	0.4
100-400	100	0.800	14399-01	1.0
200-800	50	0.800	14399-01	2.0
500-2000	20	0.800	14399-01	5.0
1000-4000	10	0.800	14399-01	10.0

Взаимосвязь между единицами жесткости.

мг/л общей жесткости по Ca = мг/л общей жесткости по CaCO₃ x 0.40
ммоль/л общей жесткости по Ca = мг/л общей жесткости по CaCO₃ x 0.01
мг/л общей жесткости по CaCO₃ = мг/л кальциевой жесткости по CaCO₃ + мг/л магниевой жесткости по CaCO₃

Контроль точности

Метод стандартных добавок

Для проверки аналитической методики используйте 20 мл стандартного раствора кальция с концентрацией 1000 мг/л по CaCO₃. Проведите анализ по описанной выше схеме. Он должен дать результат 1000 мг/л.

1. Отколите горлышко у ампулы стандарта для жесткости 10.000 мг/л по CaCO₃.
2. С помощью пипетки отберите 0.1 мл стандарта к образцу титруемому на 7-ом шаге. Возобновите титрование до достижения конечной точки. Запомните количество мл титранта ушедшего на «дотитровывание».
3. Повторите операцию два или более раз, каждый раз прибавляя по 0.1 мл и титруя до конечной точки.
4. Каждое прибавление 0.1 мл стандарта должно требовать на дотитровывание 10 дополнительных единиц 0.800 N титранта или 100 единиц 0.0800 N (11 единиц 0.714 M или 56 единиц 0.1428 M титранта). Если данная зависимость не соблюдается см. «Дополнение А, Проверка точности. Метод стандартных добавок» в руководстве к цифровому титратору.

Мешающие влияния

- Многие поливалентные ионы, хотя и распространены в значительно меньших количествах, чем кальций или магний, все таки вносят свой вклад в общую жесткость и будут включены в результаты определений.
- Некоторые переходные и тяжелые металлы способны к комплексообразованию с индикатором и маскируют цветовой переход в конечной точке титрования.
- Железо не оказывает мешающего влияния при содержании до 15 мг/л. При содержании выше указанного значения железо является причиной перехода окраски от красно-оранжевой до зеленой в конечной точке титрования. Этот переход остается достаточно четким вплоть до 30 мг/л, и его можно использовать для фиксации конечной точки титрования. Замените 0.0800M EDTA или 0.800M EDTA картридж для титрования на картридж 0.0800M CDTA или 0.800M CDTA соответственно, если предполагается, что железо оказывает мешающее влияние.
- Марганец оказывает мешающее влияние при содержании свыше 20 мг/л, маскируя конечную точку титрования. Добавление 0.1 г моногидрата гидрохлорида гидроксиламина расширяет это диапазон до 200 мг/л.
- Медь оказывает мешающее влияние в диапазоне от 0.10 до 0.20 мг/л. Кобальт и никель мешают в любом количестве и должны отсутствовать или быть замаскированы. Добавлением 0.5 г цианида калия можно расширить диапазон: для меди до 100 мг/л, для цинка до 100 мг/л, для кобальта до 100 мг/л, для никеля до 100 мг/л, для алюминия до 1 мг/л. Металлы замаскированные цианидом, не будут оказывать влияние на результат анализа.

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КОПИЯ ВЕРНА

Директор К.А. Поповников

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Осторожно!

Цианистый калий крайне токсичен! Добавляйте его в раствор только после гидроксида калия. Избыток цианида калия не влияет на результаты. Все цианидные отходы должны быть обработаны избытком сильно щелочного раствора гипохлорита натрия (отбеливатель) при перемешивании. Работайте в помещениях с хорошей вентиляцией. Утилизацию следует проводить спустя 24 часа после обработки.

- Ортофосфат замедляет переход окраски в конечной точке титрования. Для получения точных результатов в пробе не должно быть полифосфатов.
- Кислотность и щелочность до 10.000 мг/л по карбонату кальция не оказывают мешающего влияние на результаты определения.
- Насыщенный раствор хлорида натрия мешает получению четкого перехода в конечной точке титрования, однако морскую воду можно титровать напрямую.
- Добавлением содержащего одной подушечки с CDTA Magnesium Salt (магниевая соль циклогексадиаминтетрауксусной кислоты) можно расширить диапазон концентраций, в котором перечисленные ниже металлы не оказывают мешающего влияния, см. табл.2

Таблица 2.

Металл	CDTA устраняет мешающее влияние при содержании менее
алюминий	50 мг/л
кобальт	200мг/л
медь	100мг/л
железо	100мг/л
марганец	200мг/л
никель	400мг/л
цинк	300мг/л

- Если более чем один металл присутствует в концентрации описанной выше, необходимо добавить еще одну подушечку CDTA.
- Результаты по жесткости, получаемые в данном методе, содержат вклад всех металлов (естественно, если не проводилось их маскирование). Если концентрация каждого металла известна, то, используя эти данные, можно исправить полученные результаты по жесткости на жесткость только по кальцию и магнию. Вклады в жесткость на каждый мг/л металла перечислены в табл. 3 и могут быть вычтены из общей жесткости для определения жесткости по кальцию и магнию.

Таблица 3.

Металл	Вклад в общую жесткость каждого мг/л металла
алюминий	3.710
барий	0.729
кобальт	1.698
медь	1.575
железо	1.792
марганец	1.822
никель	1.705
стронций	1.142
цинк	1.531

- Барий, стронций и цинк оттитровываются напрямую.
- Образцы, имеющие высокие значения pH или высокую буферную емкость, могут превосходить буферную емкость реагентов и требуют предварительной обработки; см. «Мешающее влияние, pH» в разделе I методического руководства для спектрофотометра DR/2010.

Основы метода

После доведения pH образца до 10.1, добавляют индикатор ManVer 2, который образует красный комплекс с частью кальция и магния в пробе. При титровании ЭДТА в первую очередь взаимодействует со свободными ионами магния и кальция, а затем с ионами, связанными индикатором. При этом окраска раствора меняется на голубую (конечная точка титрования).

Необходимые реагенты		
Набор реагентов для определения общей жесткости (100 тестов):		
включает: (1) 424-32, (1) 851-49, (1) 14364-01, (1)14399-01		22720-00
Описание	Единицы	Номер по каталогу
Подушечки Man Ver 2 для определения жесткости	100 в упаковке	851-99
Буферный раствор Hardness 1	100 мл	424-32
Дистиллированная вода	4 л	272-56
Выбирается один или несколько, в зависимости от концентрации		
Картридж для титрования с ЭДТА, 0.0800 М	1	14364-01
Картридж для титрования с ЭДТА, 0.1428 М	1	14960-01
Картридж для титрования с ЭДТА, 0.714 М	1	14959-01
Картридж для титрования с ЭДТА, 0.800 М	1	14399-01
Необходимое оборудование		
Ножницы для открывания подушечек	1	968-00
Цифровой титратор	1	16900-01
Колба эрленмейера, 250 мл	1	505-46
Выбирается один или несколько в зависимости от концентрации		
Градуированный цилиндр, 10 мл	1	508-38
Градуированный цилиндр, 25 мл	1	508-40
Градуированный цилиндр, 50 мл	1	508-41
Градуированный цилиндр, 100 мл	1	508-42
Дополнительные реагенты		
Нашатырный спирт (аммония гидроксид), 10%	100 мл MDB	14736-32
Стандартный раствор CaCl ₂ 1000 мг/л по CaCO ₃	1000 мл	121-53
Подушечки с порошком ЦДТА соли магния	100	14080-99
Картридж для титрования с ЦДТА, 0.0800 М	1	14402-01
Картридж для титрования с ЦДТА, 0.800 М	1	14403-01
Стандартный раствор кальция в ампулах Voluette 10.000 мг/л, по CaCO ₃ , 10 мл	16 в упаковке	2187-10
Моногидрат гидрохлорида гидроксиламина, ACS	113 г	246-14
Man Ver 2 порошок индикатора для определения жесткости	113 г	280-14
Man Ver 2 раствор индикатора для определения жесткости	100 мл MDB	425-32
Азотная кислота, ACS	500мл	152-49
Раствор азотной кислоты, 1:1	500 мл	2540-49
Цианид калия, ACS	125 г	767-14

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Дополнительное оборудование		
Промывалка, пластик, 500мл	1	620-11
Зажим, двухзубчиковый, 38 мм	1	21145-00
Зажим-держатель	1	326-00
Деминерализирующий комплект, 473 мл	1	21846-00
Подающая трубка с загнутым на 180° концом	5 в упаковке	17205-00
Подающая трубка с загнутым на 90° концом	5 в упаковке	41578-00
pH-метр ЕС 10, портативный	1	50050-00
pH индикаторная бумага 1.0 - 11 pH	5 катушек	391-33
Пипетка TENSETTE, от 0.1 до 1.0 мл	1	19700-01
Наконечники для пипетки TENSETTE 19700-01	50 в упаковке	21856-96
Пипетка, класс А, 10 мл	1	14515-38
Пипетка, класс А, 20 мл	1	14515-20
Пипетка, класс А, 25 мл	1	14515-40
Пипетка, класс А, 50 мл	1	14515-41
Пипетка, класс А, 100 мл	1	14515-42
Устройство для наполнения пипеток, «груша»	1	14651-00
Шпатель, на 0.1 г	1	511-00
Шпатель, на 0.5 г	1	907-00
Кольцевой штатив	1	563-00
Мешалка TITRASTIR/монтажный стенд, 115 В	1	19400-00
Мешалка TITRASTIR/монтажный стенд, 230 В	1	19400-10

*За дополнительной информацией обращайтесь в компанию ЭКОИНСТРУМЕНТ.

СтройТехСнабжение

57. Жесткость общая, последовательная (10-4000 мг/л CaCO₃)

Процедура последовательного титрования с ограниченным объемом образца (метод 8329)

1. Выберите объем анализируемой пробы и картридж с ЭДТА, необходимые для проведения титрования и соответствующие ожидаемой концентрации карбоната кальция (см. табл. 1). **Замечание.** Если образец не может быть проанализирован немедленно, добавьте к нему 1.5 мл азотной кислоты на каждый литр образца для консервации последнего и предотвращения адсорбции кальция стенками контейнера. Храните пробы в холодильнике. Образцы, законсервированные таким образом, устойчивы в течение недели. Перед началом анализа проведите нейтрализацию до pH 7.
2. Вставьте чистую подающую трубку в картридж для титрования, укрепите картридж в титраторе. См. "Общее описание" и описание "по шагам" для цифрового титратора для получения более общих инструкций, если это необходимо.
3. Поворачивайте подающий винт титратора до тех пор, пока на кончике трубки не появится несколько капель титранта. Обнулите показания и промокните кончик подающей трубки. **Замечание.** Для дополнительного удобства используйте магнитную мешалку, например TitraStir (см. «Общее описание» и «п.3» в описании «по шагам» для цифрового титратора).
4. Используйте градуированный цилиндр или пипетку для отбора аликвоты образца, согласно табл.1. Перенесите образец в чистую эрленмейеровскую колбу на 250 мл (коническая отградуированная колба). Доведите объем до 100-мл деионизованной водой, если это необходимо.
5. Добавьте 2 мл 8N стандартного раствора гидроксида калия и перемешайте круговыми движениями. **Замечание.** Если объем образца 50 мл и менее, можно добавить 1 мл. **Замечание.** Магний не включается в результаты, однако должен присутствовать для более четкого перехода в конечной точке титрования. Если известно, что магний отсутствует, добавьте одну или две капли стандартного раствора 10 г/л магния по CaCO₃.
6. Добавьте к содержимому порошок-индикатор на кальций из одной подушечки CalVer 2 и перемешайте круговыми движениями. **ВНИМАНИЕ.** Для устранения мешающих влияний не используйте цианид, поскольку в дальнейшем это может привести к выделению токсичных паров.
7. Поместите кончик подготовленной на шаге 1-3 подающей трубки в раствор и, перемешивая круговыми движениями, титруйте ЭДТА, пока розовая окраска не изменится на голубую. Запишите показания титратора. **Замечание.** Вблизи конечной точки титруйте медленно, поскольку скорость реакции мала, особенно в холодных образцах.
8. Вычисления проводят по следующей формуле: Показания титратора x Числовой коэффициент (табл. 1) = мг/л CaCO₃ жесткости по кальцию. **Замечание.** Не сбрасывайте показания титратора на 0.
9. После того, как кальций будет полностью оттитрован, добавьте в колбу 1 мл 5.25N раствора серной кислоты. Добавляйте кислоту по каплям, пока раствор не сменит окраску сначала с чисто голубой на фиолетовую, затем снова на голубую и, наконец, на красную. Перемешайте раствор, чтобы убедиться в полном растворении осажденного гидроксида магния.
10. Добавьте 2 мл буферного раствора для определения жесткости (Buffer solution, Hardness, 1) и перемешайте круговыми движениями.

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11. Добавьте к содержимому порошок-индикатор на общую жесткость из одной подушечки ManVer 2 и перемешайте круговыми движениями. **Замечание.** На этом шаге можно заменить подушечку с индикатором на 0.1-граммовый шпатель с порошком ManVer 2 или 4-мя каплями раствора ManVer.
12. Поместите кончик использованного на шаге 7-8 титратора в раствор и, перемешивая круговыми движениями, титруйте ЭДТА, пока красная окраска не изменится на чисто голубую. Запишите новые показания титратора. **Замечание.** Вблизи конечной точки титруйте медленно, поскольку скорость реакции мала, особенно в холодных образцах.
13. Вычисления проводят по следующей формуле: Показания титратора x Числовой коэффициент (табл. 1) = мг/л CaCO₃ общей жесткости. **Замечание.** Концентрацию магния можно вычислить, вычтя из результата по общей жесткости результат для жесткости по кальцию.

Таблица 1

Диапазон (мг/л CaCO ₃)	Объем образца (мл)	Картридж для титрования (М ЭДТА)	Номер по каталогу	Числовой множитель
10-40	100	0.0800	14364-01	0.1
40-160	25	0.0800	14364-01	0.4
100-400	100	0.800	14399-01	1.0
200-800	50	0.800	14399-01	2.0
500-2000	20	0.800	14399-01	5.0
1000-4000	10	0.800	14399-01	10.0

Взаимосвязь между единицами жесткости.

мг/л Ca = Ca жесткость в мг/л CaCO₃ x 0.40

ммоль/л жесткости = жесткость в мг/л CaCO₃ x 0.01

мг-экв/л общей жесткости = общая жесткость в мг/л CaCO₃ x 0.02

мг/л MgCO₃ = Mg жесткость в мг/л CaCO₃ x 0.842

мг/л Mg = мг/л MgCO₃ x 0.29

Мешающие влияния

ВНИМАНИЕ. Для устранения мешающих влияний не используйте цианид, поскольку в дальнейшем это может привести к выделению токсичных паров.

- Многие поливалентные ионы, хотя и распространены в значительно меньших количествах, чем кальций или магний, все таки вносят свой вклад в общую жесткость и будут включены в результаты определений.
- Некоторые переходные и тяжелые металлы способны к комплексообразованию с индикатором и маскируют цветовой переход в конечной точке титрования.
- Железо не оказывает мешающего влияния при содержании до 15 мг/л. При содержании выше указанного значения железо является причиной перехода окраски от красно-оранжевой до зеленой в конечной точке титрования. Этот переход остается достаточно четким вплоть до 30 мг/л, и его можно использовать для фиксации конечной точки титрования. Замените 0.0800M EDTA или 0.800M EDTA картридж для титрования на картридж 0.0800M CDTA или 0.800M CDTA соответственно, если предполагается, что железо оказывает мешающее влияние.
- Марганец оказывает мешающее влияние при содержании свыше 20 мг/л, маскируя конечную точку титрования. Добавление 0.1 г моногидрата гидрохлорида гидроксиламина расширяет это диапазон до 200 мг/л.

- Медь оказывает мешающее влияние в диапазоне от 0.10 до 0.20 мг/л. Кобальт и никель мешают в любом количестве и должны отсутствовать или быть замаскированы. Добавлением 0.5 г цианида калия можно расширить диапазон: для меди до 100 мг/л, для цинка до 100 мг/л, для кобальта до 100 мг/л, для никеля до 100 мг/л, для алюминия до 1 мг/л. Металлы замаскированные цианидом, не будут оказывать влияние на результат анализа.
- Ортофосфат замедляет переход окраски в конечной точке титрования. Для получения точных результатов в пробе не должно быть полифосфатов.
- Кислотность и щелочность до 10.000 мг/л по карбонату кальция не оказывают мешающего влияние на результаты определения.
- Насыщенный раствор хлорида натрия мешает получению четкого перехода в конечной точке титрования, однако морскую воду можно титровать напрямую.
- Добавлением содержимого одной подушечки с CDTA Magnesium Salt (магниевая соль циклогексадиаминтетрауксусной кислоты) можно расширить диапазон концентраций, в котором перечисленные ниже металлы не оказывают мешающего влияния, см. табл.2

Таблица 2.

Металл	CDTA устраняет мешающее влияние при содержании менее
алюминий	50 мг/л
кобальт	200мг/л
медь	100мг/л
железо	100мг/л
марганец	200мг/л
никель	400мг/л
цинк	300мг/л

- Если более чем один металл присутствует в концентрации описанной выше, необходимо добавить еще одну подушечку CDTA.
- Результаты по жесткости, получаемые в данном методе, содержат вклад всех металлов (естественно, если не проводилось их маскирование). Если концентрация каждого металла известна, то, используя эти данные, можно исправить полученные результаты по жесткости на жесткость только по кальцию и магнию. Вклады в жесткость на каждый мг/л металла перечислены в табл. 3 и могут быть вычтены из общей жесткости для определения жесткости по кальцию и магнию.

Таблица 3.

Металл	Вклад в общую жесткость каждого мг/л металла
алюминий	3.710
барий	0.729
кобальт	1.698
медь	1.575
железо	1.792
марганец	1.822
никель	1.705
стронций	1.142
цинк	1.531

- Барий, стронций и цинк оттитровываются напрямую.



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Необходимые реагенты		
Набор реагентов для определения кальциевой жесткости (100 тестов):		
10-160 мг/л включает: (1) 282-32, (1) 424-32, (1) 928-99, (1) 947-99, (1) 2449-32, (1) 14364-01		24486-00
100-4000 мг/л включает: 1) 282-32, (1) 424-32, (1) 928-99, (1) 947-99, (1) 2449-32, (1) 14399-01		24487-00
Описание	Единицы	Номер по каталогу
Подушечки CalVer 2	100 в упаковке	947-99
Буферный раствор Hardness 1	100 мл	424-32
Подушечки Man Ver 2	100 в упаковке	928-99
Стандартный раствор гидроксида калия, 8.00 N	100 мл*	282-32
Стандартный раствор серной кислоты, 5.25 N	100 мл*	2449-32
Дистиллированная вода	4 л	272-56
Выбирается один или несколько, в зависимости от концентрации		
Картридж для титрования с ЭДТА, 0.0800 M	1	14364-01
Картридж для титрования с ЭДТА, 0.1428 M	1	14960-01
Картридж для титрования с ЭДТА, 0.714 M	1	14959-01
Картридж для титрования с ЭДТА, 0.800 M	1	14399-01
Необходимое оборудование		
Цифровой титратор	1	16900-01
Колба эрленмейера, 250 мл	1	505-46
Ножницы для открывания подушечек	1	968-00
Выбирается один или несколько в зависимости от концентрации		
Градуированный цилиндр, 10 мл	1	508-38
Градуированный цилиндр, 25 мл	1	508-40
Градуированный цилиндр, 50 мл	1	508-41
Градуированный цилиндр, 100 мл	1	508-42
Дополнительные реагенты		
Магниева соль ЦДТА в подушечках	100 в упак.	14080-99
Картридж для титрования с ЦДТА, 0.0800 M	1	14402-01
Картридж для титрования с ЦДТА, 0.800 M	1	14403-01
Man Ver 2 раствор для определения жесткости	100 мл MDB	425-32
Стандартный раствор кальция в ампулах Voluette 10.000 мг/л, по CaCO ₃ , 10 мл	16 в упаковке	2187-10
Моногидрат гидрохлорида гидроксиламина, ACS	113 г	246-14
Азотная кислота 70%, ACS	500мл	152-49



Дополнительное оборудование		
Промывалка, пластик, 500мл	1	620-11
Зажим, двухзубчиковый, 38 мм	1	21145-00
Зажим-держатель	1	326-00
Деминерализующий комплект, 473 мл	1	21846-00
Подающая трубка с загнутым на 180° концом	5 в упаковке	17205-00
Подающая трубка с загнутым на 90° концом	5 в упаковке	41578-00
pH-метр ЕС 10, портативный	1	50050-00
pH индикаторная бумага 1.0 - 11 pH	5 катушек	391-33
Пипетка TENSETTE, от 0.1 до 1.0 мл	1	19700-01
Наконечники для пипетки TENSETTE 19700-01	50 в упаковке	21856-96
Пипетка, класс А, 10 мл	1	14515-38
Пипетка, класс А, 20 мл	1	14515-20
Пипетка, класс А, 25 мл	1	14515-40
Пипетка, класс А, 50 мл	1	14515-41
Пипетка, класс А, 100 мл	1	14515-42
Устройство для наполнения пипеток, «груша»	1	14651-00
Шпатель, на 0.1 г	1	511-00
Шпатель, на 0.5 г	1	907-00
Кольцевой штатив	1	563-00
Мешалка TITRASTIR/монтажный стенд, 115 В	1	19400-00
Мешалка TITRASTIR/монтажный стенд, 230 В	1	19400-10

*За дополнительной информацией обращайтесь в компанию ЭКОИНСТРУМЕНТ.Ъ

СтройТехСнабжение



КОПИЯ ВЕРНА

57-95

Директор К.А. Поповников