**Safety data sheet**
**According to Regulation n. 1907/2006 and Regulation 878/2020**
**TRIVALENT SALT AU 58%**
**Potassium tetrakis(cyano-C)aurate (Au 58%)**

Revision n. VII of 2021.10.22
Replaces revision n VI of 2019.01.21

## 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product identifier

| | |
|---|---|
| Chemical name | Double cyanide of potassium and gold (III) |
| Product code | 27 |
| C.A.S. Registry Number | 14263-59-3 |
| EINECS Number | 238-145-9 |
| Molecular weight | 340,0 |
| Brut formula | $[KAu(CN)_4]$ |
| Commercial name | Double cyanide of potassium and gold (Au 58%) |
| REACH registration number | A REACH registration number is not available for this substance as the annual quantity produced or imported is less than one tonne. |

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

| | |
|---|---|
| Intended uses | Industrial use |
| Uses adviced against | None in particular |

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

| | |
|---|---|
| Name | FAGGI ENRICO S.P.A. |
| Adress | Via Majorana, 101/103 50019 Sesto Fiorentino FI |
| Telephone number | 055311861 |
| Fax number | 055311791 |
| Competent person responsible for the safety data sheet | lorenzo.magaldi@faggi.it |

### 1.4 Emergency telephone number

111 - Medical helpline operating in England, in Scotland (NHS 24) and in Wales (NHS Direct Wales).

### 1.5 Registration number

For this product a registration number is not available as it is a mixure

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

| Hazard classes | Category codes | Hazard statements |
|---|---|---|
| Met corr. | **1** | **H290** |
| Skin Irrit. | **2** | **H315** |
| Eye Dam. | **1** | **H318** |
| Acute toxicity (inhalation) STA 5 mg/kg bw | **2** | **H330** |
| Acute toxicity (dermal) STA: 0.5 mg/kg bw | **1** | **H310** |
| Acute toxicity (ingestion) STA: 5 mg/kg bw | **2** | **H300** |
| Aquatic Acute (M Factor: 1) | **1** | **H400** |
| Aquatic chronic (M Factor: 1) | **1** | **H410** |

### 2.2 Label elements

**Pictograms**

**Signal words** **DANGER**

**Hazard statements**

| | |
|---|---|
| H290 | It can be corrosive to metals |
| H315 | Causes skin irritation |
| H318 | Causes serious eye damage |
| H330 | Fatal if inhaled |
| H310 | Fatal in contact with the skin |
| H300 | Fatal if ingested |
| H410 | Very toxic to aquatic life with long lasting effects |

**Additional hazard statement / identification elements (EU)**

| | |
|---|---|
| EUH032 | Contact with acids liberates very toxic gas |

**Precautionary statements**

| | |
|---|---|
| P270 | Do not eat, drink or smoke during use |
| P273 | Do not disperse in the environment |
| P280 | Wear protective gloves / clothing / eye protection / face protection |
| P310 | IF SWALLOWED: Immediately call a POISON CENTER or doctor |
| P302+P352 | IN CASE OF CONTACT WITH SKIN: wash thoroughly with soap and water. |
| P403+P233 | Keep container tightly closed and in a ventilated place |

**2.3 Other hazards**

Hydrogen cyanide can cause all levels of poisoning.
Under the action of acids (including carbon dioxide) hydrogen cyanide is released, which is flammable and together with the air can form explosive gas mixtures.
Avoid contact with acids, air humidity, water.
It does NOT contain PBT / vPvB substances according to Regulation (EC) 1907/2006, annex XIII
It does NOT contain substances that interfere with the endocrine system in accordance with Regulation (EC) 1907/2006 art.59 paragraph 1 and in accordance with the criteria established in

Regulation (EU) 2017/2100 and Regulation (EU) 2018/605.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substance Potassium tetrakis(cyano-C)aurate

CAS Number 14263-59-3
EINECS Number 238-145-9
INDEX Not available

## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

| | |
|---|---|
| Inhalation | In the event of the formation of aerosols, mists, dusts or fumes, inhalation is possible. No mouth-to-mouth or mouth-to-nose resuscitation. Use artificial respiration bag or artificial respirator. Danger of intoxication. Keep the respiratory tract clean. In case of lack of air, administer oxygen. Immediately call a doctor for emergency services (keyword: cyanide / hydrogen cyanide poisoning). |
| Ingestion | Rinse your mouth. Give plenty of water to drink immediately. Induce vomiting. Call a doctor for first aid immediately. (keyword: cyanide / hydrogen cyanide poisoning) |
| Contact with skin | If dry, uninjured skin comes into contact with dry sodium or potassium cyanide, cyanide poisoning has not been observed so far. In case of contact with skin, wash with plenty of water and soap. With symptoms of intoxication immediately alert the emergency room doctor (keyword: cyanide / hydrogen cyanide intoxication). |
| Contact with eyes | The use of special washing solutions with high buffer capacity (e.g. borate buffer solution, diphtoterins, etc.) are recommended as part of first aid measures. Keeping the eye open, immediately wash thoroughly with plenty of water for at least 10 minutes.<br><br>With symptoms of intoxication immediately alert the emergency room doctor (keyword: intoxication with cyanide / hydrogen cyanide) |

Recommendations:

| | |
|---|---|
| • Need to see a doctor immediately | YES |
| • Possibility of delayed effects following exposure | YES |
| | YES |

• Move the exposed individual from the place of exposure to the open air

YES

• Remove the clothing and shoes of the exposed individual

With gloves

• How to handle contaminated clothing

YES

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

Possible signs of poisoning: It seems appropriate to differentiate between two stages:
1. Slight intoxication
2. Severe intoxication
The following symptoms do not provide sure indications of prognosis.
Central nervous system symptoms:
Initial stage: headache, dizziness, drowsiness, nausea.
Advanced stage: convulsions, coma.
Pulmonary symptoms:
Initial stage: dyspnea, tachypnea.
Advanced stage: hypoventilation, Cheyne-Stokes breathing, apnea
Cardiovascular symptoms:
Initial stage: Hypertonia, sinus node arrhythmia, AV node arrhythmia, bradycardia.
Advanced stage: tachycardia, complex arrhythmias, cardiac arrest.
Skin symptoms:
Initial stage: Red complexion.
Advanced stage: Cyanosis.
Effect on metabolism: Lactate acidosis at pH 7.1 and lactate levels up to 17 mm / liter have been described.

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

Therapy: Prevent reabsorption and ensure vital functions, strictly adhering to self-protection measures. Rapid antidote therapy can be life-saving and takes precedence over elimination of poison.
Therapy: Slight intoxication. 100% artificial respiration with oxygen. Based on the symptoms and the clinical picture, detailed examinations of the reports, symptomatic treatment for pulmonary edema prophylaxis and diagnostics (lung radiography) are required.
Therapy with antidote: for example, administration of sodium thiosulfate 12.5 g - 100-500 mg / kg intravenously, according to the clinical findings and symptoms. Attention! The dosage applies to an adult of 70 kg. Any person poisoned by cyanide must be monitored continuously for many hours even if the patient feels well. This is to ensure that no new symptoms or previous ones remain.
Therapy: severe intoxication.
Artificial respiration with oxygen. Immediate administration of antidote.
The medicines listed below can be used for antidote therapy:
Complex trainer
1. Administer intravenous hydroxocobalamin (Cyanokit®) 5g (70 mg / kg for adults) over an infusion period of 20-30 minutes. This dosage can be repeated, according to the severity of the intoxication. The infusion period for repeated administration is 30 minutes up to 2 hours. Hydroxocobalamin can only be administered intravenously.

2. Dicobalt edetate (Kelocyanor®) 300 mg (1 vial) for adults in 1-3 minutes, intravenously.
Methemoglobin trainer:
1. 4-dimethylaminophenol, (4-Dmap) sodium thiosulfate: the antidote is administered in the following sequence:
to. 4-DMAP, 250 mg (3-4 mg for each kg of body weight) in 5 ml IV (vial) followed by
b. sodium thiosulfate 12.5 g in 50 ml IV- infusion.
If the antidote has been administered and the diagnosis is not that of cyanide intoxication and you have methemoglobin> 30%, you can administer toluidine blue or methylene blue, to suspend the effect of the cyanide antidote. WARNING: this should be done with the utmost caution and only in the hospital, due to the renewed emission of cyanide in the blood.

## 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media

| | |
|---|---|
| Suitable extinguishing media | alkaline fire fighting powder. |
| Unsuitable extinguishing media | water, carbon dioxide (CO2), foam, acid fire fighting material, acid fire fighting powders. |

### 5.2 Special hazards arising from the substance or mixture

In the event of a fire, hydrogen cyanide can be released.

### 5.3 Advice for firefighters

| | |
|---|---|
| General information: | Prevent the water used to extinguish the fire from flowing into the sewer, groundwater or surface water. |
| **Equipment:** | Normal firefighting clothing, such as self-contained open-circuit compressed air breathing apparatus (EN137), flame retardant suit (EN469), flame retardant gloves (EN659) and firefighter boots (HOA29 or A30) |

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

***6.1.1. For non-emergency personnel***

Keep away from contaminated area and keep upwind

***6.1.2. For emergency responders***

Wear:
Semi-face masks with ABEK2P3 filters compliant with the EN14387: 2004 standard
Chemical risk gloves compliant with EN420 and EN374 standards
Splash goggles compliant with Directive 89/686 / EEC and standard EN166: 2001
Complete clothing compliant with the UNI EN 13034: 2006 type 6 standard

### 6.2 Environmental precautions

Do not send the product to the following compartments:

- ground
- ground water

• sewer

In case of pollution of rivers, lakes or sewers, inform the competent authorities in accordance with local laws.

In the event of a fire, the extinguishing water must not reach the sewers, the groundwater, or the surface waters. In the event of a fire, remove the endangered containers and take them to a safe place, if it can be done safely.

**6.3 Methods and material for containment and cleaning up**

***6.3.1. Advice in order to contain a spill***

Close (if possible) or cover drains

***6.3.2. Advice in order to clean-up a spill***

1. solid substance:

Collect mechanically. Collect in suitable containers. The collected material must be reused or disposed of according to regulations. To absorb the spilled substance, it is recommended to use an approved industrial vacuum cleaner.

2. solution:

Absorb with liquid retaining material, for example: inert absorbent medium, diatomaceous earth or acid absorbent. Collect mechanically. Collect in suitable containers. The collected material must be reused or disposed of according to regulations.

***6.3.3*** **Other information**

The substance, the packaging, the fire extinguishing water and the remains of any fire must be sent to an appropriate disposal facility, in compliance with waste regulations.

**6.4 Reference to other sections**

None

## 7. HANDLING AND STORAGE

**7.1. Precautions for safe handling**

***7.1.1. Raccomentations in order to manipulate the substance or the mixture in a safe manner, such as containement measures and prevention of fire and aereosol and powders formation***

Avoid the formation of dust and keep away from incompatible materials (acids, acid salts, aluminum). Use only under a suction hood. Keep fire extinguishers and means of containment such as inert absorbent media, diatomaceous earth or absorbent for acids nearby.

***7.1.2. General recommendation on work hygiene***

Do not eat, drink and smoke in work areas. Wash your hands after use. Remove contaminated clothing and protective equipment before entering eating areas

**7.2. Conditions Safe storage, including any incompatibilities**

***7.2.1. Risk management associated with explosive atmospheres, corrosive conditions, flammability hazards, incompatible substances or mixtures, evaporative conditions, potential ignition sources***

The product itself does not burn but if involved in a fire it can release toxic gases.
Suitable containers: plastic.
In case of release of hydrogen cyanide: The formation of flammable or explosive dust / air mixtures is possible.
Keep suitable fire extinguishers and plenty of water near the substance.

Open the containers under suction and close them immediately after use.

***7.2.2. Control of weather conditions, ambient pressure, temperature, sunlight, humidity, and vibration***

Keep in a locked and ventilated place. Protect against solar radiation and the action of heat.

***7.2.3. Conditions to maintain the integrity of the substance or mixture***

Store in original containers. Keep the containers tightly closed and store them in a dry and well ventilated, clean, dry, closable place.

***7.2.4. Advice regarding the ventilation, specific design for storage rooms or vessels, quantity limits under storage conditions, packaging compatibilities***

Do not store near: acids and acid salts.
Keep the substances in a locked deposit with forced ventilation.
Use ADR approved packaging

**7.3. Specific end use(s)**

Industrial use

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1. Control parameters**

(such as Potassium Cyanide CAS 151-50-8 EC 205-792-3)
Control parameters: 5 mg / m3 Permitted limit value (OEL (IT))
Remarks: Source for limit values: ACGIH
Control parameters: Skin designation: (OEL (IT))
It can be absorbed through the epidermis.
Suitable measurement procedures are:
Potassium cyanide: OSHA method ID120
NIOSH method 7904
Hydrogen cyanide: OSHA method ID120

**8.2. Exposure controls**

Provide appropriate air extraction / evacuation in the workplace and on the operating machine.
Provide for the installation of an emergency shower and an eye shower.

***8.2.1. Appropriate engineering controls***

It is possible to evaluate the installation of a detector of diffuse emissions of hydrogen cyanide in the workplace.

***8.2.2. Individual protection measures, such as personal protective equipment***

| | |
|---|---|
| **Eye/face protection** | Goggles with side shields compliant with Directive 89/686 / EEC and with standard EN166: 2001 |
| **Skin protection (hands)** | Glove material:<br>• Natural latex (NR) Material thickness 0.5 mm<br>Breakthrough time ≥ 480 min Method DIN EN374 |

| | |
|---|---|
| | • Nitril Material thickness 0.11 mm<br>• Breakthrough time ≥ 480 min Method DIN EN374 |
| | • Nitril Material thickness 0.33 mm Breakthrough time ≥ 480 min MethodDIN EN374 |
| | • Polychloroprene with natural latex coating Material thickness 0.6 mm Breakthrough time ≥ 480 min Method DIN EN374 |
| **Skin protection (body)** | Complete clothing compliant with the UNI EN 13034: 2006 type 6 standard<br>When cleaning: rubber or plastic boots |
| **Respiratory protection** | When hydrogen cyanide occurs:<br>Wear self-contained breathing apparatus. Observe the maximum times of use of respiratory protection.<br>In case of dust / aerosol:<br>Respirator with combined filter B-P3<br>Respirator with combined filter ABEK-P3 |
| **Thermal hazards** | The substance does not present thermal hazards |

***8.2.3. Environmental exposure controls***

Prevent the spillage of solutions containing cyanide in groundwater, soil, sewers. Provide for closing the manholes while moving the solutions. Do not store in areas with sewage drains.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| Physical state | Crystalline solid |
| Colour | White |
| Odour | None when dry. If wet, it smells of bitter almonds |

| | |
|---|---|
| Melting point/freezing point | Not available |
| Boiling point or initial boiling point and boiling range | Not applicable |
| Flammability | Not flammable |
| Lower and upper explosion limit | Not flammable |
| Flash point | Not applicable |
| Auto-ignition temperature | Not flammable |
| Decomposition temperature | Decomposes at temperatures above 300 ° C |
| pH | 10 (100 g/l in water) |
| Kinematic viscosity | Not applicable |
| Solubility | 10 g / l in water at 20 ° C |
| Partition coefficient n-octanol/water (log value) | Not applicable |
| Vapour pressure | Not applicable |
| Density and/or relative density | Not available |
| Relative vapour density | Not applicable |
| Particle characteristics | Not available |

**9.2. Other information**

None

**10. STABILITY AND REACTIVITY**

**10.1 Reactivity**

Danger of hydrocyanic acid formation in contact with acids, carbon dioxide, air humidity

**10.2 Chemical stability**

The product is stable under normal storage conditions

**10.3 Possibility of hazardous reactions**

If involved in a large fire there is the possibility of hydrocyanic acid formation.

**10.4 Conditions to avoid**

Under the action of acids (including carbon dioxide) hydrogen cyanide is released, which is flammable and together with the air can form explosive gas mixtures. Keep away from acid salts.

**10.5 Incompatible materials**

Acids, acid salts. Over time, even the air can lead to the formation of hydrogen cyanide in a confined environment or in containers that are not hermetically closed.

**10.6 Hazardous decomposition products**

HCN hydrogen cyanide (hydrogen cyanide)

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

| | |
|---|---|
| **Acute toxicity** | LD50 oral rat: 7.49 mg / kg bw<br><br>Rat inhalation LC50: 103 mg / m3<br><br>LD50 dermal rat: 14.29 mg / kg bw |
| **Skin corrosion / irritation** | The irritating effect on the skin cannot be determined as a result of acute dermal toxicity |
| **Serious eye damage/irritation** | The irritating effect on the eyes cannot be determined as a result of acute dermal toxicity |
| **Respiratory or skin sensitization** | No data are available |
| **Germ cell mutagenicity** | Not mutagenic |
| **Carcinogenicity** | Not carcinogenic |
| **Reproductive toxicity** | Not toxic for reproduction |
| **STOT – single exposure** | Not applicable |
| **STOT – repeated exposure** | DNEL workers: 9.4 mg / m3 for 8 hours<br><br>Target organ: thyroid gland. |

| | | |
|---|---|---|
| | **Aspiration hazard** | Inhalation (about 200 ppm HCN in atmospheric air is enough) or ingestion (about 200 - 300 mg KCN) can cause immediate loss of consciousness and death. |

**11.2 Information on other hazards**
It can be absorbed into the skin, particularly if the skin is sweaty or injured.

**12. ECOLOGICAL INFORMATION**

| | | |
|---|---|---|
| **12.1** | **Toxicity** | EC acute (fish) 15.8 µg/L<br>EC chronic (fish) 2 µg/L |
| **12.2** | **Persistence and degradability** | Quickly degraded both aerobically and anaerobically |
| **12.3** | **Bioaccumulative potential** | BCF (aquatic species): 3.162 L/kg ww<br>BCF (terrestrial species): 3.162 L/kg ww |
| **12.4** | **Mobility in soil** | KOC: 2.84 L/kg |
| **12.5** | **Results of PBT and vPvB assessment** | Not applicable |
| **12.6** | **Endocrine disrupting properties** | No known effects |
| **12.7** | **Other adverse effects** | None |

**13. DISPOSAL CONSIDERATIONS**

**13.1. Waste treatment methods**
This product and its packaging must be disposed of in authorized facilities. An CER code of hazardous waste must be assigned on the basis of the provisions of Directive 2008/98 / EC and subsequent amendments and additions.
The packaging and labeling of waste must be identical to that of the pure product. Do not remove the labels from the packaging until their final destination.
Do not reuse empty containers.
Cyanide waste can only be treated and decontaminated by authorized companies

**14. TRANSPORT INFORMATION**

| | | |
|---|---|---|
| **14.1** | **UN number or ID number** | 1588 |
| **14.2** | **UN proper shipping name** | Inorganic cyanides, solid, n.o.s. |
| **14.3** | **Transport hazard class(es)** | 6.1 toxic |
| **14.4** | **Packing group** | II |
| **14.5** | **Environmental hazards** | Dangerous for the environnement |
| **14.6** | **Special precautions for user** | Approved packaging |
| **14.7** | **Maritime transport in bulk according to IMO instruments** | |

**15. REGULATORY INFORMATION**

| | | |
|---|---|---|
| ***15.1*** | **Safety, health and environmental regulations/legislation specific for the substance or mixture** | **Applicability** |
| | **Reg. (EC) 1907/2006 / EC Reach** | YES |
| | **Reg. (EC) 1272/2008 CLP and subsequent changes and additions** | YES |
| | **Reg. (CE) 2037/2000 "Substances that deplete the ozone layer"** | NO |
| | **Reg. (EC) 850/2004 "Persistent organic pollutants"** | NO |
| | **Reg. (EC) 689/2008 "export and import of dangerous chemicals"** | NO |
| | **Substance listed in Annex I of Dir. 2012/18 / EU so-called Seveso** | |
| | **Legislative Decree 81/2008 Consolidated Law on health and safety at work** | YES |
| | **Directive 2014/103 / EU "Adr"** | YES |
| | **R.D. 09/01/1927 "Toxic gases"** | NO |

***15.2*** **Chemical safety assessment**

A chemical safety assessment was not carried out

**16. OTHER INFORMATION**

**16.1** **Changes compared to the previous edition**

Regulatory update

**16.2** **Acronim and abbreviation legend**

ADR : Agreement concerning the International Carriage of Dangerous Goods by Road
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstract Service

**16.3** **Main references and data sources**

ECHA's data bank on registered substances and soon to be registered substances:
http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances

**16.5** **Adequate training for workers in order to ensure the protection of human health and the environment**

Training on Chemical Risk pursuant to Legislative Decree 81/08 Title IX dangerous substances
DPI training
• Training for obtaining a license for handling toxic gases