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. XII – 20.02.2024
Replaces revision n XI – 03.08.2023

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

1.1 Product identifier

Chemical name	Potassium tetrakis(cyano-C)aurate
Product code	27
C.A.S.	14263-59-3
EC Number	238-145-9
Index	Not available
Molecular weight	340,0
Raw formula	$[KAu(CN)_4]$
Commercial name	Trivalent salt Au 58 %
REACH registration number	Exempt according to art. 6(1)

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

Intended uses	Industrial use. Additive for galvanic baths
Uses adviced against	None in particular

1.3 Details of the supplier of the safety data sheet

Name	FAGGI ENRICO S.P.A.
Address	Via Majorana, 101/103 50019 Sesto Fiorentino FI
Telephone number	055311861
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)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Hazard classes	Category codes	Hazard statements
May be corrosive to metals	**1**	**H290**
Causes skin irritation	**2**	**H315**
May cause an allergic skin reaction	**1**	**H317**
Causes serious eye damage	**1**	**H318**
Fatal if inhaled: ATE 0.05 mg/L (dust)	**2**	**H330**
Fatal in contact with skin: ATE: 5 mg/kg bw	**1**	**H310**
Fatal if swallowed: ATE: 5 mg/kg bw	**2**	**H300**
May cause damage to organs through prolonged or repeated exposure	**2**	**H373**
Very toxic to aquatic life (M Factor: 1)	**1**	**H400**
Very toxic to aquatic life with long lasting effects (M Factor: 1)	**1**	**H410**
Contact with acids liberates very toxic gas		**EUH032**

2.2 Label elements

Pictograms

Signal word **DANGER**

Hazard statements

	H290	May be corrosive to metals
	H315	Causes skin irritation
	H317	May cause an allergic skin reaction
	H318	Causes serious eye damage
	H330	Fatal if inhaled
	H310	Fatal in contact with the skin
	H300	Fatal if ingested
	H373	May cause damage to organs through prolonged or repeated exposure
	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
EC Number	238-145-9
INDEX	Not available
ATE (inhalation)	0.05 mg/l
ATE (dermal) ATE:	.5 mg/kg bw
ATE (oral) ATE:	5 mg/kg bw
M Factor (acute)	1
M Factor (chronic)	1

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. 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
• Move the exposed individual from the place of exposure to the open air	YES
• Remove the clothing and shoes of the exposed individual	Yes
• How to handle contaminated clothing	With gloves
• For first aiders, wear PPE	

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

Prevent the water used to extinguish the fire from flowing into the sewer, groundwater or surface water.

General information:

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. Additive for galvanic baths

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Since no control parameters have been defined for the substance itself, values relating to potassium cyanide are reported (CAS 151-50-8 CE 205-792-3)
Control parameters:
TLV (ceiling value): 5 mg/m3 as STEL (skin)
EU-OEL: 1 mg/m^3 as TWA
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
As no specific studies are available for potassium tetrakis(cyano-C)aurate, values relating to potassium dicyanoaurate(I) (CAS: 13967-50-5) are reported below, considering the chemical similarity between the two substances.
DNEL (potassium dicyanoaurate (I)):
Systemic effects for long-term exposure – inhalation: 0.071 mg/m^3
Systemic effects for long-term exposure – dermal: 0.1 mg/kg bw/day

PNEC (potassium dicyanoaurate (I)):
Fresh water: 0.2 µg/L
Fresh water (intermittent release): 2 µg/L
Sea water: 0.02 µg/L
STP: 6 mg/L
Sediment (freshwater): 0.33 mg/kg dry weight
Sediment (sea water): 0.033 mg/kg dry weight
Soil: 0.067 mg/kg dry weight

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.
Use only in rooms equipped with air extraction

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)	Gloves compliant with EN 374 Glove Material: Nitrile rubber Thickness 0.40 mm Penetration time > 30 minutes
Skin protection (body)	Complete clothing compliant with the UNI EN 13034: 2006 type 6 standard When cleaning: rubber or plastic boots
Respiratory protection	When hydrogen cyanide occurs:

		Wear self-contained breathing apparatus. Observe the maximum times of use of respiratory protection. In case of dust / aerosol: Respirator with combined filter B-P3 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	About 100 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	1.22 g/cm^3
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	ATE (inhalation dust): 0.05 mg/l ATE (dermal): 5 mg/kg bw ATE (oral): 5 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	The product may cause allergic reactions on the skin. No available data
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	May cause damage to organs through prolonged or repeated exposure. Data not available

11.2 Information on other hazards

Hydrocyanic acid can cause all levels of poisoning.
Under the action of acids (including carbon dioxide), hydrocyanic acid is released, which is flammable and together with air can form explosive gaseous 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.

12. ECOLOGICAL INFORMATION

12.1 Toxicity	Very toxic to aquatic organisms even with long lasting effects. Data not available
12.2 Persistence and degradability	Quickly degraded both aerobically and anaerobically

12.3	**Bioaccumulative potential**	No available data
12.4	**Mobility in soil**	No available data
12.5	**Results of PBT and vPvB assessment**	Not applicable (inorganic substance)
12.6	**Endocrine disrupting properties**	No known effects
12.7	**Other adverse effects**	No known effects

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**	3290
14.2	**UN proper shipping name**	TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S. (Potassium tetrakis(cyano-C)aurate)

14.3 Transport hazard classes

ADR/RID/IMDG/ICAO-IATA: Class: 6.1 + 8
ADR/RID/IMDG/ICAO-IATA: Label: 6.1 + 8 + Dangerous for the environment mark
ADR: Tunnel restriction code: C/E
IMDG - EmS : F-A, S-A

14.4 Packing group II

14.5 Dangers for the environment

ADR/RID/ICAO-IATA: Dangerous for the environment
IMDG: Marine Contaminant: YES

14.6 Special precautions for users

Transport must be carried out by vehicles authorized for the transport of dangerous goods according to the provisions of the current edition of the A.D.R. Agreement. and the applicable national provisions. Transport must be carried out in the original packaging and, in any case, in packaging which is made of materials which cannot be attacked by the contents and which are not likely to generate dangerous reactions. Those responsible for loading and unloading dangerous goods must have received appropriate training on the risks presented by the preparation and on any procedures to be adopted in the event of emergency situations.

14.7 Maritime transport in bulk in accordance with the IMO Acts

Bulk transport is not foreseen

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	YES
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
Reg. (CE) 1907/2006/CE Reach art. 59 – Candidate List of Substances of Very High Concern (SVHC)	NO
Reg. (CE) 1907/2006/CE Reach - Annex XIV – Authorisation List	NO
Reg. (CE) 1907/2006/CE Reach - Annex XVII – Restriction List	Limited use Item 75 (check link)
https://echa.europa.eu/it/substances-restricted-under-reach	

15.2 **Chemical safety assessment**

A chemical safety assessment was not carried out

16. **OTHER INFORMATION**

Changes compared to the previous edition

Modified sections 2 – 3 – 8 – 11 - 14

Acronim and abbreviation legend

ADR: European agreement concerning the international transport of dangerous goods by road
GHS: Globally Harmonized System of Classification and Labeling of Substances
EINECS: European Inventory of Chemical Substances
CAS: Chemical Abstract Service
Met. Corr: metal corrosive
Skin irrit. : skin irritation
Skin sens.: skin sensitisation
ATE: estimated acute toxicity
PBT: Persistent, Bioaccumulative, Toxic
vPvB: very persistent, very bioaccumulative
LD: lethal dose
PNEC: predicted no effect concentration
DNEL: derived no effect level
TLV (ceiling value): threshold limit value
STEL: short term exposition level
EU-OEL: European occupational exposure limit
TWA: time weighted average
EC: effective concentration
NOAEL: no observed adverse effect level
LC: lethal concentration
NOEC: no observed effect concentration
LOEC: lowest observed effect concentration
Koc: organic carbon-water partition co-efficient

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

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
PPE training
Training for obtaining a license for handling toxic gases