

Section 1 - Identification of the Substance / Mixture and of the Company / Undertaking

Product Identifier

Product Name	Gold potassium cyanide
Chemical Name	Gold(I) potassium cyanide
Synonyms	Aurate(1-),bis(cyano-C),potassium; Aurate(1-),bis(cyano-)-,potassium; Aurouspotassiumcyanide; bis(cyano-c)-aurate(1-potassium); Potassiumaurcyanide; Gold Potassium Cyanide; Potassium aurocyanide; Potassium cyanoaurate
Proper Shipping Name	CYANIDES, INORGANIC, SOLID, N.O.S. (potassium dicyanoaurate(I)), MARINE POLLUTANT
Other Means of Identification	K[Au(CN) ₂]
CAS Number	13967-50-5
EC Number	237-748-4

Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Relevant identified uses	Laboratory use, Manufacture of substances
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Details of the Supplier of the Safety Data Sheet

Registered Company Name	Siltech PMR Pty Ltd
Address	7 / 220 Barry Road Campbellfield Vic 3061 Australia
Telephone	+61 3 9357 9540 (Business Hours)
Fax	
Website	http://www.siltechpmr.com.au
Email	bojanb@siltech.com.au

Emergency Telephone Number

Association / Organisation	Siltech PMR Pty Ltd
Emergency Telephone Numbers	+61 419 686 484

Section 2 - Hazards Identification

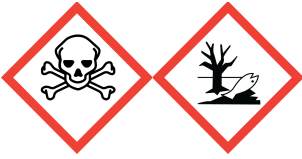
Classification of the Substances or Mixture

Hazardous Chemical. Dangerous Goods. According to the Model WHS Regulations and the ADG Code.

Poisons Schedule	S7
GHS Classification	Acute toxicity, Oral (Category 2) Acute toxicity, Inhalation (Category 2) Acute toxicity, Dermal (Category 1) Acute aquatic toxicity (Category 1) Chronic aquatic toxicity (Category 1)



Label Elements

GHS Label Elements	
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Signal Word	DANGER
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Hazard Statement(s)

H300	Fatal if swallowed.
H310	Fatal in contact with skin.
H330	Fatal if inhaled.
H410	Very toxic to aquatic life with long lasting effects

Precautionary Statement(s) Prevention

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P262	Do not get in eyes, on skin or on clothing.
P264	Wash skin thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves / protective clothing

Precautionary Statement(s) Response

P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.
P302 + P352 + P310	IF ON SKIN: Wash with plenty of water. Immediately call a POISON CENTER or doctor/physician.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
P361 + P364	Remove/Take off immediately all contaminated clothing and wash it before reuse.

Precautionary Statement(s) Storage

P405	Store locked up
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary Statement(s) Disposal

P501	Dispose of contents/container in accordance with national regulations
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Other Hazards

Contact with acids liberates very toxic gas.



Section 3 - Composition / Information on Ingredients

Substances

CAS No.	%[weight]	Name
13967-50-5	100	Potassium dicyanoaurate(I)

Section 4 - First Aid Measures

Description of First Aid Measures

General Information	Immediately remove and clothing soiled by the product Remove breathing equipment only after contaminated clothing has been completely removed In case of irregular breathing or respiratory arrest provide artificial respiration
Eye Contact	Rinse opened eye for several minutes under running water. Then consult a doctor
Skin Contact	Immediately wash with water and soap and rinse thoroughly
Inhalation	Supply fresh air or oxygen; Call for a doctor. In case of unconsciousness place patient stably in side position for transportation
Ingestion	Do not induce vomiting; Call for medical help immediately.

Indication of any Immediate Medical Attention and Special Treatment Needed

No further relevant information available

Section 5 - Firefighting Measures

Extinguishing Media

- CO₂
- Dry Chemical Powder
- Water spray

Special Hazards Arising from the Substrate or Mixture

Fire Incompatibility	None known
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Advice for Firefighters

Fire Fighting	Fight larger fires with water spray or alcohol resistant foam. PPE: Mouth respiratory protective device
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Section 6 - Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures	Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
Environmental Precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
Methods and materials for containment and cleaning up	Pick up and arrange disposal without creating dust. Sweep up and shovel. Do not flush with water. Keep in suitable, closed containers for disposal.
Reference to other sections	For disposal see section 13 For personal protection see section 8



Section 7 - Handling and Storage

Precautions for Safe Handling

Safe Handling	No special measures required. Thorough dedusting. Ensure good ventilation/exhaustion at the workplace. Open and handle receptacle with care.
Other Information	Keep away from foodstuffs, beverages and feed. Wash hands before breaks and at the end of work. Store protective clothing separately. Avoid contact with the eyes and skin.

Conditions for Safe Storage, Including any Incompatibilities

Suitable Container	Keep container tightly sealed
Storage Incompatibility	Do not store together with acids.

Section 8 - Exposure Controls / Personal Protection

Control Parameters

Occupational Exposure Limits (OEL)

Ingredient Data

Source	Ingredient	Material Name	TWA	Notes
Australia. Workplace Exposure Standards for Airborne Contaminants	Potassium dicyanoaurate(I)	Potassium dicyanoaurate(I)	5 mg/m ³	Skin absorption

Emergency Limits

Exposure Controls

Appropriate Engineering Controls	Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product
Eye and Face Protection	Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU)
Skin Protection	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it
Body Protection	Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific work site
Respiratory Protection	In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.



Section 9 - Physical and Chemical Properties

Information on Basic Physical and Chemical Properties

Appearance	Crystalline - White		
Physical State	Solid	Relative Density (Water = 1)	3.45 g/mL at 25°C
Odour	Odourless	Partition Coefficient n-octanol / water	Not determined
Odour Threshold	Not determined	Auto-ignition Temperature (°C)	Not applicable
pH (as supplied)	Not applicable	Decomposition Temperature	Not determined
Melting Point / Freezing Point (°C)	Undetermined	Viscosity (cSt)	Not applicable
Initial Boiling Point and Boiling Range (°C)	Undetermined	Molecular Weight (g/mol)	288.1
Flash point (°C)	Not applicable	Taste	Not determined
Evaporation rate	Not applicable	Explosive properties	Product does not present an explosion hazard
Flammability	Product is not flammable	Oxidising properties	Not determined
Upper Explosive Limit (%)	Not applicable	Surface Tension (dyn/cm or mN/m)	Not determined
Lower Explosive Limit (%)	Not applicable	Volatile Component (%vol)	Not determined
Vapour Pressure (kPa)	Not applicable	Gas Group	Not determined
Solubility in Water (g/L)	Fully miscible	pH as a solution (1%)	Not determined
Vapour Density (Air = 1)	Not applicable	VOC g/L	0

Section 10 - Stability and Reactivity

Reactivity	No data available.
Chemical Stability	Stable under recommended storage conditions.
Thermal Decomposition	No decomposition if used according to specifications.
Possibility of Hazardous Reactions	No Dangerous reactions known.
Conditions to Avoid	No further relevant information available.
Incompatible Materials	Strong acids, Strong oxidising agents
Hazardous Decomposition Products	No dangerous decomposition products known



Section 11 - Toxicological Information

Information on Toxicological Effects

Acute toxicity	No data available.
Skin corrosion/irritation	No data available.
Serious eye damage/eye irritation	No data available.
Respiratory or skin sensitisation	No data available.
Germ cell mutagenicity	No data available.
Carcinogenicity	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC
Reproductive toxicity	No data available.
Specific target organ toxicity - single exposure	No data available.
Specific target organ toxicity - repeated exposure	No data available.
Aspiration hazard	No data available.

Inhaled	<p>Inhalation of dusts, generated by the material, during the course of normal handling, may produce severely toxic effects; these may be fatal.</p> <p>The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.</p> <p>The intensity and time of exposure to hydrogen cyanide determines effects, symptoms. Short term inhalation of 20 to 40 ppm hydrogen cyanide may result in slight symptoms. Higher concentrations can cause death within minutes or hours; a concentration of 270 ppm can be fatal in one minute.</p> <p>Acute exposure to cyanides can cause death by cyanosis, asphyxia. At very low doses, symptoms of hydrogen cyanide exposure may be weakness, headaches, confusion, giddiness, dizziness, confusion, anxiety, nausea and vomiting. Normal blood pressure with rapid pulse is usual in mild cases. The respiratory rate varies with the intensity of exposure: rapid with mild exposure, or slow and gasping with severe exposure.</p> <p>Symptoms of mild exposure to hydrogen cyanide are completely reversed when exposure ceases.</p> <p>In severe cases, breathing is rapid and deep, then becomes slow and gasping. The victim may feel an irregular heartbeat and tightness in the chest. The skin appears bright pink or red. Fluid may fill the lungs and interfere with breathing. Unconsciousness, convulsions and death can quickly follow depending on the degree of exposure.</p>
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	<p>Massive exposures may produce sudden collapse and death. concentration of 270 If death does not result, recovery is usually complete. There have however been a few reports of after-effects. These are similar to those seen in people deprived of oxygen, e.g. near-drowning victims</p>
Ingestion	<p>Severely toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 5 gram may be fatal or may produce serious damage to the health of the individual.</p> <p>The toxic properties of cyanide depend on its ability to inhibit enzymes required for the respiration of cells within the body. Acute exposure can cause profuse ineffective breathing, irregular heartbeat, unconsciousness, coma and death by asphyxia. At very low dosages symptoms include weakness, headache, confusion, nausea and vomiting. Normal blood pressure with rapid pulse is usual in mild cases. The respiratory rate varies with the intensity of exposure: rapid with mild exposure, or slow and gasping with severe exposure.</p> <p>Symptoms of mild exposure are reversed when exposure ceases.</p> <p>Symptoms of poisoning may include salivation, nausea without vomiting, anxiety, confusion, vertigo, giddiness, lower jaw stiffness, convulsions, spasm (opisthotonos), paralysis, coma and cardiac arrhythmias.</p> <p>Cyanide readily forms stable complexes with biologically active metal ions, notably the ferric ion of cytochrome oxidase, producing significant inhibition of enzyme activity with a consequent loss of a cell's ability to utilise oxygen.</p> <p>Cyanosis (blue-grey discolouration of the skin and lips) is often present in cyanide and nitrile poisonings but may be a late finding. Non-lethal doses of cyanide are eventually released from the complex to be transformed to thiocyanate and excreted in the urine.</p>
Skin Contact	<p>Skin contact with the material may produce severely toxic effects; systemic effects may result following absorption and these may be fatal.</p> <p>Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period.</p> <p>Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.</p> <p>Skin contact may produce "cyanide rash" with itching, also macular, papular and vesicular eruptions. Secondary infections may follow. Contact irritation causes readily reversible change which disappears after exposure ends.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects.</p>



	<p>Examine the skin prior to the use of the material and ensure that any external damage is suitably protected</p>
Eye	<p>Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result. The material may produce foreign body irritation in certain individuals</p>
Chronic	<p>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p> <p>There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals.</p> <p>Long term exposure to high dust concentrations may cause changes in lung function (i.e. pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the lung. A prime symptom is breathlessness. Lung shadows show on X-ray.</p> <p>The toxic properties of cyanide result from its ability to inhibit enzymes required for the respiration of cells within the body. Chronic exposure to cyanides, at levels too low to produce clinical complaints, may cause dermatitis, itching, scarlet rash, perforation of nasal septum, throat irritation, muscular cramps, weight loss and enlargement of the thyroid gland. Workers with pre-existing CNS, heart and lung disorders are at significant risk.</p> <p>A wide range of symptoms are thought to be caused by long-term, low-level (often less than 10 ppm) exposure to cyanides. Symptoms include persistent runny nose, weakness, dizziness, giddiness, headache, nausea, vomiting, abdominal pain, throat irritation, changes in taste and smell, muscle cramps, weight loss, flushing of the face, itching and irritation of the upper respiratory tract, throat and eyes and enlargement of the thyroid gland. These symptoms are not specific to cyanide exposure; therefore it has been difficult to prove that chronic cyanide toxicity exists.</p> <p>Repeated minor contact with cyanides produces a characteristic scarlet rash with itching, papules (small, superficial raised spots on the skin), perforation of the nasal septum and possible sensitisation. Concerns have been expressed that low-level, long term exposures may result in damage to the nerves of the eye.</p> <p>Chronic exposure to cyanides and certain nitriles may result in interference to iodine uptake by thyroid gland and its consequent enlargement. This occurs following metabolic conversion of the cyanide moiety to the less toxic thiocyanate which is excreted in the urine. Thyroid insufficiency may also occur as a result of metabolic conversion of cyanides to the corresponding thiocyanate. A small amount of cyanide is excreted, unchanged, in the breath, sweat and urine.</p> <p>Intramuscular administration of gold salts in the treatment of rheumatoid arthritis has produced toxic reactions (often of an allergic nature) with symptoms including dermatitis, nausea, vomiting, diarrhoea, nephritis, blood disorders, peripheral neuritis, hepatitis and encephalitis. After absorption gold is carried from the plasma to practically every tissue and dermal appendage in the body. Gold remains in the plasma for many months with more than three-</p>



	<p>quarters becoming ultimately fixed in kidneys, liver, skin, hair and nails. Gold salts may damage the stem cell which acts as the precursor to components of the blood. Loss of the stem cell may result in pancytopenia (a reduction in the number of red and white blood cells and platelets) with a latency period corresponding to the lifetime of the individual blood cells. Granulocytopenia (a reduction in granular leukocytes) develops within days and thrombocytopenia (a disorder involving platelets), within 1-2 weeks, whilst loss of erythrocytes (red blood cells) need months to become clinically manifest. Aplastic anaemia develops due to complete destruction of the stem cells.</p> <p>Dermatoses following contact with gold (such as in the wearing of jewelry), or administration of its compounds (during the treatment of rheumatoid arthritis) are manifested as contact sensitivity with chronic papular eruption, erythema, allergic contact purpura and exfoliating dermatitis. "Gold nephrosis" occurs rarely in patients undergoing intramuscular treatment with gold thioglucose and produces facial and ankle oedema, erythematous rash in the periorbital area and generalised erythematous plaques. Systemic exposure to gold compounds may also produce stomatitis, metallic taste, itching, erythema, eczema, erythema multiforme, exfoliative dermatitis, thrombocytopenia, leucopenia, agranulocytosis and aplastic anaemia. Such exposure may also produce a grey-blue pigmentation (chrysiasis) in the skin and mucous membranes, especially in areas exposed to light. Gold may deposit in the eyes producing keratitis and corneal ulceration.</p>
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	Toxicity	Irritation
Potassium dicyanoaurate(I)	Oral (rat) LD50: 5 mg/kg	

Section 12 - Ecological Information

Toxicity

Aquatic toxicity: No further relevant information available

Persistence and degradability: No further relevant information available

Behaviour in Environmental Systems

Bioaccumulative potential: No further relevant information available

Mobility in soil: No further relevant information available

Ecotoxicological Effects

Remark: Very toxic for fish

Additional Ecological Information

General notes:

Water hazard class 3 (German Regulation) (Self-assessment): Extremely hazardous for water

Do not allow product to reach ground water, water course or sewage system, even in small quantities

Danger to drinking water if even extremely small quantities leak into the ground.

Also poisonous for fish and plankton in water bodies.

Very toxic for aquatic organisms

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.



Other adverse effects: No further relevant information available

Section 13 - Disposal Considerations

**Waste Treatment Methods**

Recommendation	Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.	
Uncleaned Packaging:	Recommendation:	Disposal must be made according to official regulations
	Recommended cleansing agents:	Water, if necessary together with cleansing agents

Section 14 - Transport Information**Labels Required**

Toxic	
Marine Pollutant	
HAZCHEM	2X

Land Transport (ADG)

UN Number	1588	
Packing Group	II	
UN Proper Shipping Name	1588 CYANIDES, INORGANIC, SOLID, N.O.S. (potassium dicyanoaurate(I))	
Environmental Hazard	Marine pollutant	
Transport Hazard Class(es)	Class	6.1
	Subrisk	
Special Precautions for User	Special Provisions	Warning: Toxic Substances
	Limited Quantity	500g

Air Transport (IATA - DGR)

UN Number	1588	
Packing Group	II	
UN Proper Shipping Name	CYANIDES, INORGANIC, SOLID, N.O.S.	
Environmental Hazard	No	
Transport Hazard Class(es)	ICAO / IATA Class	6.1
	ICAO / IATA Subrisk	
	ERG Code	6L
Special Precautions for User	No data available	

Sea Transport (IMDG)



UN Number	1588	
Packing Group	II	
UN Proper Shipping Name	CYANIDES, INORGANIC, SOLID, N.O.S. (potassium dicyanoaurate(I)), MARINE POLLUTANT	
Environmental Hazard	Marine pollutant	
Transport Hazard Class(es)	IMDG Class	6.1
	IMDG Subrisk	
Special Precautions for User	EMS Number	F-A-S-A
	Special Provisions	No data available
	Limited Quantities	500 g

Section 15 - Regulatory Information

Safety, Health and Environmental Regulations / Legislation Specific for the Substance or Mixture

National Inventory	Status
Australia - AICS	On the inventory, or in compliance with the inventory
Canada - DSL	All components of this product are on the Canadian DSL
China - IECSC	On the inventory, or in compliance with the inventory
Japan - ENCS	On the inventory, or in compliance with the inventory
Korea - KECI	On the inventory, or in compliance with the inventory
New Zealand - NZIoC	Not in compliance with the inventory - Potassium dicyanoaurate(I)
Philippines - PICCS	On the inventory, or in compliance with the inventory

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.

Contact:

Siltech PMR
7 / 220 Barry Road
Campbellfield, Victoria, 3061
Australia

Abbreviations and acronyms:

ADR: 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
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOCV: Swiss Ordinance on volatile organic compounds
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

End of Safety Data Sheet