CHLOROAURIC ACID

GHS Safety Data Sheet

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
CHLOROAURIC ACID

OTHER NAMES
HAuCl4.xH2O, "auric acid", "brown gold chloride", "chlorauric acid", "chloroauric acid anhydrous", "gold trichloride hydrochloride", "hydrogen tetrachloroaurate(1-)", "hydrogen tetrachloraurate (III)", "tetrachloroauric acid"

PROPER SHIPPING NAME
CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.(contains chloroauric acid)

PRODUCT USE
Laboratory reagent; source of soluble gold salts.

SUPPLIER
Company: S D FINE- CHEM LIMITED
Address:
315- 317, T.V.Ind.Estate,
248, Worli Road,
Mumbai- 400030, India
www.sdfine.com
Telephone: 91- 22 24959898/99
Fax: 91- 22 2493 7232
Email: technical@sdfine.com

Section 2 - HAZARDS IDENTIFICATION

GHS Classification
Acute Toxicity Category 1
Acute Toxicity Category 2
Metal Corrosion Category 1
Serious Eye Damage Category 1
Skin Corrosion/Irritation Category 1B
Skin Sensitizer Category 1
STOT - RE Category 1

EMERGENCY OVERVIEW

HAZARD
DANGER

Determined by using GHS criteria

H290	May be corrosive to metals.
H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H372	Causes damage to organs through prolonged or repeated exposure.

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PRECAUTIONARY STATEMENTS

Prevention

Code	Phrase
P234	Keep only in original container.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash ... thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well- ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P284	Wear respiratory protection.

Response

Code	Phrase
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+P350	IF ON SKIN: Gently wash with plenty of soap and water.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position 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.
P310	Immediately call a POISON CENTER or doctor/physician.
P314	Get medical advice/attention if you feel unwell.
P320	Specific treatment is urgent (see MSDS).
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.

Storage

Code	Phrase
P403+P233	Store in a well- ventilated place. Keep container tightly closed.
P405	Store locked up.
P406	Store in corrosive resistant container or with a resistant inner liner.

Disposal

Code	Phrase
P501	Dispose of contents/container to ...

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
chloroauric acid	16961-25-4	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

EYE

■ If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.

SKIN

■ If skin or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.

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• Quickly remove all contaminated clothing, including footwear.
• Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
• Transport to hospital, or doctor.

INHALED
• If fumes or combustion products are inhaled remove from contaminated area.
• Lay patient down. Keep warm and rested.
• Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
• Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
• Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
• Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
• As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.
• Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.

NOTES TO PHYSICIAN
■ Most of the toxic effects arising from gold therapy may be effectively treated with injections of dimercaptol or penicillamine may be given by mouth.
Skin disorders may require topical or systemic corticosteroid therapy.
For acute or short term repeated exposures to strong acids:
• Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
• Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
• Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
• Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
• Water spray or fog.
• Foam.
• Dry chemical powder.
• BCF (where regulations permit).

FIRE FIGHTING
• Alert Fire Brigade and tell them location and nature of hazard.
• Wear full body protective clothing with breathing apparatus.
• Prevent, by any means available, spillage from entering drains or water course.
• Use fire fighting procedures suitable for surrounding area.

FIRE/EXPLOSION HAZARD
• Non combustible.
• Not considered to be a significant fire risk.
• Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
• Heating may cause expansion or decomposition leading to violent rupture of containers.
Decomposition may produce toxic fumes of: hydrogen chloride, metal oxides.

FIRE INCOMPATIBILITY
■ None known.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
• Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
• Check regularly for spills and leaks.
• Clean up all spills immediately.
• Avoid contact with skin and eyes.
• Wear protective clothing, gloves, safety glasses and dust respirator.
• Use dry clean up procedures and avoid generating dust.

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MAJOR SPILLS
• Clear area of personnel and move upwind.
• Alert Fire Brigade and tell them location and nature of hazard.
• Wear full body protective clothing with breathing apparatus.
• Prevent, by any means available, spillage from entering drains or water course.
Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
• Avoid all personal contact, including inhalation.
• Wear protective clothing when risk of exposure occurs.
• Use in a well-ventilated area.
• WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.

PACKAGING MATERIAL INCOMPATIBILITIES

Chemical Name	Container Type
	" Acetal (Delrinr)" , " Cast iron" , Neoprene

SUITABLE CONTAINER
• DO NOT use aluminium or galvanised containers.
• Check regularly for spills and leaks.
• Glass container is suitable for laboratory quantities.
• Lined metal can, lined metal pail/ can.
• Plastic pail.
• Polyliner drum.
• Packing as recommended by manufacturer.
For low viscosity materials
• Drums and jerricans must be of the non-removable head type.
• Where a can is to be used as an inner package, the can must have a screwed enclosure. <</>.

STORAGE INCOMPATIBILITY
■ For gold salts:
• The action of ammonia or ammonium salts on gold salts under a wide range of conditions gives fulminating gold which is a compound of uncertain composition but containing gold-nitrogen bonds - this material is heat-, friction-, and impact sensitive, and explosive when dry.
• Supported metal catalysts containing gold should never be prepared by impregnation of the support using solutions that contain gold and ammonia. Catalysts supported in such a manner contain extremely sensitive gold-nitrogen compounds which, when dry, may explode at a light touch.
• Many gold compounds exhibit a tendency to decompose violently with separation of the metal.
• Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.
• Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts - neutralisation can generate dangerously large amounts of heat in small spaces.
• The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
• The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting "bumping" can spatter the acid.
• WARNING: Avoid or control reaction with peroxides. All transition metal peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.
• The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono-or poly-fluorobenzene show extreme sensitivity to heat and are explosive.
• Avoid reaction with borohydrides or cyanoborohydrides.
• Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
• These trifluorides are hypergolic oxidisers. They ignites on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
• The state of subdivision may affect the results.

STORAGE REQUIREMENTS
• Store in original containers.
• Keep containers securely sealed.
• Store in a cool, dry, well-ventilated area.
• Store away from incompatible materials and foodstuff containers.
Store away from light and moisture.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS
The following materials had no OELs on our records
• chloroauric acid: CAS:27988- 77- 8 CAS:16961- 25- 4

MATERIAL DATA
CHLOROAURIC ACID:
■ Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations.
It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.
At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience).
NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

PERSONAL PROTECTION

RESPIRATOR
• Acid vapour Type B cartridge/ canister. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE
• Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure
• Chemical goggles.whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted
• Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.
• Alternatively a gas mask may replace splash goggles and face shields.

HANDS/FEET
• Elbow length PVC gloves.
NOTE:
• The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
• Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

OTHER
• Overalls.
• PVC Apron.
• PVC protective suit may be required if exposure severe.
• Eyewash unit.

ENGINEERING CONTROLS
■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Bright golden yellow-crystalline powder.No odour.Soluble in water.May discolour on exposure to light .Hygroscopic.

PHYSICAL PROPERTIES
Mixes with water.
Corrosive.
Acid.
Toxic or noxious vapours/gas.

State	DIVIDED SOLID	Molecular Weight	339.79
Melting Range (°C)	Not available	Viscosity	Not Applicable
Boiling Range (°C)	Not available	Solubility in water (g/L)	Miscible
Flash Point (°C)	Not applicable	pH (1% solution)	Not available
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not available
Autoignition Temp (°C)	Not available	Vapour Pressure (kPa)	Not available
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	3.9
Lower Explosive Limit (%)	Not applicable	Relative Vapour Density (air=1)	Not Applicable
Volatile Component (%vol)	Not available	Evaporation Rate	Not Applicable

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY
• Contact with alkaline material liberates heat.
• Presence of incompatible materials.
• Product is considered stable.
• Hazardous polymerisation will not occur.
For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

Health hazard summary table:

Acute toxicity	Acute Tox. (dermal) 1 Acute Tox. (inhal) 2
Skin corrosion/irritation	Skin Corr. 1 B
Serious eye damage/irritation	Eye Dam. 1
Respiratory or skin sensitization	Skin Sens. 1
Germ cell mutagenicity	Not applicable
Carcinogenicity	Not applicable
Reproductive toxicity	Not applicable
STOT- single exposure	Not applicable
STOT- repeated exposure	STOT RE 1
Aspiration hazard	Not applicable

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
■ Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus.
Immediate pain and difficulties in swallowing and speaking may also be evident.
■ The material is not thought to produce adverse health effects following ingestion (as classified by EC Directives using animal models).
Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum.

EYE
■ The material can produce chemical burns to the eye following direct contact.
Vapours or mists may be extremely irritating.
■ If applied to the eyes, this material causes severe eye damage.
■ Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns.
Mild burns of the epithelia generally recover rapidly and completely.

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SKIN
■ Skin contact with the material may produce severely toxic effects; systemic effects may result following absorption and these may be fatal.
■ The material can produce chemical burns following direct contactwith the skin.
■ Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED
■ Inhalation of dusts, generated by the material, during the course of normal handling, may produce severely toxic effects; these may be fatal.
■ The material can cause respiratory irritation in some persons.
The body's response to such irritation can cause further lung damage.
■ Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage.
There may be dizziness, headache, nausea and weakness.
■ 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.
■ Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.

CHRONIC HEALTH EFFECTS
■ Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining.
Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva.
Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.
Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.
Toxic: danger of serious damage to health by prolonged exposure if swallowed.
This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. This has been demonstrated via both short- and long-term experimentation.
Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.
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. Prime symptom is breathlessness; lung shadows show on X-ray.
intramuscular administration of gold salts for rheumatoid arthritis can cause poisoning; the symptoms include dermatitis, nausea and vomiting, diarrhoea, inflamed kidneys, inflamed nerves of the extremities, hepatitis and brain infection. Gold accumulates in the body and is largely not removed.
Skin disruptions following contact with gold or its compounds (for example in treating rheumatoid arthritis) are characterised as chronic eruption of spots, redness, and sloughing. There may be swelling of the face and ankle, a red rash around the mouth and generalised red patches. Systemic exposure may produce inflammation of the mouth and skin, reduction in the number of platelets and white blood cells, agranulocytosis and aplastic anaemia. There may be a grey-blue pigmentation in the skin and mucous membranes. Gold may deposit in the eyes, producing inflammation and ulceration of the cornea.

TOXICITY AND IRRITATION
■ The following information refers to contact allergens as a group and may not be specific to this product.
Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.
Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound.
The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.
The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
No significant acute toxicological data identified in literature search.

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Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
chloroauric acid	No Data Available	No Data Available	No Data Available	No Data Available

Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction.
- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.

Recycle wherever possible.

- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurrying in water; Neutralisation with soda-lime or soda-ash followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: CORROSIVE

HAZCHEM:
2X

Land Transport UNDG:

Class or division:	8	Subsidiary risk:	None
UN No.:	3260	UN packing group:	II

Shipping Name:CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (contains chloroauric acid)

Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	None
UN/ID Number:	3260	Packing Group:	II
Special provisions:	A3A803		

Shipping name:CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.(contains chloroauric acid)

Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	None
UN Number:	3260	Packing Group:	II
EMS Number:	F- A, S- B	Special provisions:	274

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Limited Quantities: 1 kg
Shipping name:CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.(contains chloroauric acid)

Section 15 - REGULATORY INFORMATION

REGULATIONS

chloroauric acid (CAS: 27988-77-8,16961-25-4) is found on the following regulatory lists;
"Acros Transport Information","FisherTransport Information","Sigma-AldrichTransport Information"

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
chloroauric acid	27988- 77- 8, 16961- 25- 4

■ Classification of the preparation and its individual components has drawn on official and authoritative sources using available literature references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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