

Au chloride solution According to Regulation n. 1907/2006 and Regulation 878/2020 Au chloride solution 200 g Au/l (HAuCl4)

Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING 1. 1.1 Product identifier Chemical name Au chloride solution 200 g Au/l Product code 121 UFI code 3DA0-605Y-X00X-QV9T 1.2 Relevant identified uses of the substance or mixture and uses advised against Recommended uses Industrial use. Additive for electroplating 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 lorenzo.magaldi@faggi.it Competent person responsible for the safety data sheet 1.4 **Emergency telephone** 111 - Medical helpline operating in England, in Scotland (NHS number 24) and in Wales (NHS Direct Wales).

1.5 Registration numberA REACH registration number is not available as this product
is a mixure.

2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture according to Regulation (EC) n. 1272/2008

Hazard class	Category codes	Hazards indications
Met Corr	1	H290
AcuteTox.	4	H302
Skin Corr.	1 A	H314
Eye Dam.	1	H318
STOT SE	3	H335
STOT RE	2	H373
Aquatic Chronic	2	H411
Corrosive for the respiratory		EUH071
tract		

2.2 Label elements

Pictograms



Signal word Hazard statements	DANGER	
	H290	May be corrosive to metals
	H302	Harmful if swallowed
	H314	Causes serious skin burns and serious eye injuries
	H335	Can irritate the respiratory tract



Au chloride solution According to Regulation n. 1907/2006 and Regulation 878/2020 Au chloride solution 200 g Au/l (HAuCl4)

Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

		H373	May cause damage to organs through	
		H411	prolonged or repeated exposure Toxic to aquatic life with long lasting effects	
	Duranting and in	EUH071	Corrosive for the respiratory tract	
	Precautionary advice	P260		
			Manuarta stina alanca / alathina / ana	
		P280	Wear protective gloves / clothing / eye protection / face protection	
		P301+P330+P331	IF SWALLOWED: rinse mouth. DO NOT induce vomiting	
		P305+P351+P338	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.	
		P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing.	
		P310	Rinse skin with water [or shower] Immediately call a POISON CENTER or doctor/physician	
	UFI code	3DA0-605Y-X00X-QV		
2.3	Other hazards	It does NOT contain PBT / vPvB substances according to		
		Regulation (EC) 1907	•	
		• • • •	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	•	
	COMPOSITION/INFORMATIO	N ON INGREDIENTS		
32	Mixure	-		

3.

3.2 Mixure

Concentration

Product identifier	%	Classifications	
		Hazard	
		Classes	Category codes
Tetrachloroauric acid	20 ≤ C ≤ 25%	Met. corr. 1	H290
CAS: 16903-35-8		Acute tox. 4	H302
EC: 240-948-4		Skin corr 1B	H314
INDEX: not available		Eye dam 1	H318
N. REACH: exempt for quantity		STOT RE 2	H373
ATE (oral) LD50 464 mg/kg bw		Aq. Chronic 2	H411
M factor (chronic): 1			EUH071
Hydrochloric acid	25 ≤ C ≤ 30%	Met corr. 1	H290
CAS 7647-01-0		Skin. corr. 1A	H314
EC: 231-595-7		Eye corr. 1	H318
INDEX: 017-002-01-X		STOT SE 3	H335



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Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

> REACH No. 01-211948862-27-XXXX ATE: not applicable Specific limits: C ≥ 25 % Eye damage 1 Corrosive to metals 1 Acute target organ toxicity single exposure 3 Skin corrosion 1A $10\% \le C < 25\%$ Eye damage 1 Corrosive to metals 1 Acute target organ toxicity single exposure 3 Skin corrosion 1B $1\% \le C < 10\%$ Eye damage 1 Corrosive to metals 1 $0.1\% \le C < 1\%$ Corrosive to metals 1

4. FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation	Keep the injured person at rest in an airy and warm environment. In case of respiratory arrest, use artificial respiration methods
Ingestion	Do not induce vomiting. Drink plenty of water and consult a doctor
Contact with skin	Immediately wash skin with plenty of water. Consult a physician
Contact with eyes	Immediately rinse the eyes with plenty of water until the irritation
	subsides. Do not use eye drops or ointments. Consult an
	ophthalmologist specialist

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 	YES

4.2 Most important symptoms and effects, both acute and delayed

Eye, nose and throat irritation, chest pain, choking, skin irritation, corneal burns, skin burn (after severe exposure), nausea, vomiting: Abundant and bleeding mucous secretions, bronchitis, pulmonary edema, corneal necrosis, tissue necrosis, perforation of the gastrointestinal tract

4.3 Indication of any immediate medical attention and special treatment needed

Consult a physician immediately. Emergency showers and eye washing systems must be available in the workplace.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

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



Au chloride solution According to Regulation n. 1907/2006 and Regulation 878/2020 Au chloride solution 200 g Au/l (HAuCl4)

Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

	Unsuit	able extinguishing media	Normal fire-fighting 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)	
5.2	If invo	ecial hazards arising from the substance or mixture nvolved in a fire it can develop hydrochloric acid, toxic for inhalation. The product reacts with tals to develop hydrogen, which is highly flammable.		
5.3	Advice	e for firefighters		
	Genera		event the water used to extinguish the fire from flowing into e sewer, groundwater or surface water.	
	Gener	No cor sui	rmal fire-fighting clothing, such as self-contained open-circuit npressed air breathing apparatus (EN137), flame retardant t (EN469), flame retardant gloves (EN659) and firefighter	
	Equipr		ots (HOA29 or A30)	
~ ~			-	
6.1			e equipment and emergency procedures	
	6.1.1.	For non-emergency pers	ited area and keep upwind	
	6.1. 2 .	For emergency responde		
	0.1.2.	Wear:	575	
			compliant with FN420 FN374 Standards	
Gloves for chemical risks compliant with EN420 EN374 Stand Complete clothing compliant with the UNI EN 13034: 2006 st				
			BEK2P3 R filters conforming to EN14387: 2004 + A1: 2008	
6.2	-			
0.2	Prevent infiltration into the sewer, groundwater and surface water			
6.3	Methods and material for containment and cleaning up			
	6.3.1.	Advice in order to conto		
			priate absorbent material (sand, sawdust) and place in airtight	
		container		
	6.3.2. Advice in order to clean-up a spill		-up a spill	
		Wash the area with pler	nty of water	
	6.3.3	Other information		
		None		
6.4		Reference to other sect	ions	
		None		
	HAND	LING AND STORAGE		
7.1.	Precau	itions for safe handling		
	7.1.1.		able the substance or mixture to be handled safely, such as	
containment meas		containment measures o	and prevention of fires and the formation of aerosols and	
		dust		
		Store in original and labe	led packaging.	

Store in original and labeled packaging.

- 7.1.2. General recommendations 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.

6.



Au chloride solution According to Regulation n. 1907/2006 and Regulation 878/2020 Au chloride solution 200 g Au/l (HAuCl4)

Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

	7.2.1.	Risk management associated with explosive atmospheres, corrosive conditions, flammability hazards, incompatible substances or mixtures, evaporative conditions, potential ignition sources Keep the container tight and sealed until use. Keep away from acid substances.
	7.2.2	Containment of the effects of weather conditions, pressure, temperature, sunlight, humidity and vibrations Store in a cool, dry place
	7.2.3.	Conditions for keeping substances / mixtures intact Open containers must be resealed and kept straight
7.3.	7.2.4	Provisions relating to ventilation, specific design of storage rooms or containers, quantitative limits in storage conditions, compatibility of packaging Use PE and PP plastic packaging or other resistant materials. Keep the packages in a containment basin Specific end use(s)
		Industrial use. Additive for electroplating EXPOSURE CONTROLS/PERSONAL PROTECTION
8.1.		Control parameters for tetrachloroauric acid DNEL Workers Systemic effects for long-term exposure – inhalation: 0.14 mg/m3 Systemic effects for short-term exposure – inhalation: Hazard unknown but no further information is needed as no exposure is expected Local effects for long-term exposure – inhalation: High hazard (no derived threshold) Local effects for short-term exposure – inhalation: High hazard (no derived threshold) Systemic effects for long-term exposure – dermal: 0.04 mg/kg body weight per day Systemic effects for long-term exposure – dermal: Hazard unknown but no further information is needed as no exposure is expected Local effects for long-term exposure – dermal: High hazard (no derived threshold) Local effects for short-term exposure – dermal: High hazard (no derived threshold) Local effects for short-term exposure – dermal: High hazard (no derived threshold) Local effects for short-term exposure – dermal: High hazard (no derived threshold) Eye hazards: High risk (no derived threshold) derivative) <u>General population</u> Systemic effects for long-term exposure – inhalation: 0.035 mg/m3 Systemic effects for long-term exposure – inhalation: Moderate hazard (no derived threshold) Local effects for long-term exposure – inhalation: Moderate hazard (no derived threshold) Local effects for short-term exposure – dermal: Hazard unknown but no further information is needed as no exposure is expected Local effects for long-term exposure – dermal: Hazard unknown but no further information is needed as no exposure is expected Local effects for short-term exposure – dermal: Hazard unknown but no further information is needed as no exposure is expected Local effects for long-term exposure – dermal: Hazard unknown but no further information is needed as no exposure is expected Local effects for long-term exposure – dermal: Hazard unknown but no further information is needed as no exposure is expected Local effects for short-term exposure – dermal: Hazard unknown but no further information is needed as no exposure

8



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Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

> Short-term systemic effects – oral: Hazard unknown but no further information is needed as no exposure is expected Eye hazards: No hazards identified

PNEC

Freshwater: 1.04 μg/L Marine water: 0.104 μg/L Sewage treatment plant: 0.2 mg/L Sediment (freshwater): 20.45 mg/kg sediment dry weight Sediment (marine water): 20.45 mg/kg sediment dry weight Soil: 4.15 mg/kg soil dry weight

Control parameters for hydrochloric acid DNEL

Workers

Systemic effects for long-term exposure - inhalation: no hazard identified Systemic effects for short-term exposure - inhalation: no hazard identified Local effects for long-term exposure – inhalation: 8 mg/m3 Local effects for short-term exposure - inhalation: 15 mg/m3 Systemic effects for long-term exposure - dermal: no hazard identified Systemic effects for short-term exposure - dermal: no hazard identified Local effects for long-term exposure – dermal: High hazard (no derived threshold) Local effects for short-term exposure - dermal: High hazard (no derived threshold) Hazards for eyes: Moderate risk (no derived threshold) 8-hour limit value: 5 ppm mg/m3 Legislative Decree 81/08 (IT) Short-term limit value: 10 ppm 15 mg/m3 Legislative Decree 81/08 General population Systemic effects for long-term exposure - inhalation: no hazard identified Systemic effects for short-term exposure - inhalation: no hazard identified Local effects for long-term exposure – inhalation: 8 mg/m3 Local effects for short-term exposure - inhalation: 15 mg/m3 Systemic effects for long-term exposure - dermal: no hazard identified Systemic effects for short-term exposure - dermal: no hazard identified Local effects for long-term exposure – dermal: High hazard (no derived threshold) Local effects for short-term exposure – dermal: High hazard (no derived threshold) Systemic effects for long-term exposure - oral: no hazard identified Systemic effects for short-term exposure - oral: no hazard identified Eye hazards: Moderate risk (no derived threshold)

PNEC

Fresh water: no hazard identified Marine water: no hazard identified Sewage Treatment Plant: No Hazard Identified Sediment (Fresh Water): No Hazard Identified Sediment (Marine Water): No Hazard Identified Soil: No Hazard Identified

Exposure controls

8.2.1. Appropriate engineering controls

Ventilation systems. Emergency showers and eye washing system near the work area.

8.2.2. Individual protection measures, such as personal protective equipment

8.2.



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Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

Eye/face protection	Splash goggles compliant with Directive 89/686 / EEC and standard EN166: 2001
Skin protection (hands)	Chemical gloves according to EN 420 EN 374 Glove material: fluoro rubber, butyl rubber, chloroprene, nitrile rubber, PVC, latex Material thickness: 0.5 mm Penetration time: ≥ 60 min DIN EN374 method
Skin protection (body)	Complete clothing compliant with the UNI EN 13034: 2006 type 6 standard
Respiratory protection	Filter masks with filter type E in case of exceeding TWA MAK limits
Thermal hazards	Splash goggles compliant with Directive 89/686 / EEC and standard EN166: 2001

8.2.3. Environmental exposure controls

Maintain suction in all environments using localized collection systems and ambient air exchange. Convey the aspirated volumes to an abatement system and then into the atmosphere. Do not use recirculating air suction systems. Avoid any spillage into the environment.

9

9.1

PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemica	I properties
Physical state	Liquid
Color	Orange
Odor	Pungent
Melting point / freezing point	Unavailable
Boiling point or initial boiling point and	Unavailable
boiling range	
Flammability	Not inflammable
Lower and upper explosive limits	Not applicable
Flash point	Not applicable
Self-ignition temperature	Not applicable
Decomposition temperature	Not applicable
рН	<1
Cinomatic viscosity	Undofined

Cinematic viscosity Solubility

<1 Undefined Fully miscible in water

Production coefficient n-octanol / water	Not applicable
(logarithmic value)	
Vapor pressure	Not applicable
Density and / or relative density	3.9 g / cm3
Relative vapor density	12.6 KPa
Characteristics of the particles	Not applicable
Other information	



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Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

		None		
10		STABILITY AND REACTIVITY		
	10.1	Reactivity		
		Hydrochloric acid is a strong acid with corre	osive action with numerous metals. It can	
		produce corrosive vapors		
	10.2	Chemical stability		
		Stable under normal storage conditions		
	10.3	Possibility of hazardous reactions		
		The product reacts with:		
		- common construction metals with evolut	ion of highly flammable hydrogen gas,	
		 alkali and organic bases with violent evolution 		
		- lime stone, marble, dolomite and other ca	arbonic minerals with evolution of	
		suffocating CO2 gas,		
		- strong oxidants (bleaching agents, conc. I	12O2, HNO3, etc. and their salts, chromates,	
		permanganates, etc) with evolution of toxi	c chlorine gas,	
		- sulphides with evolution of toxic H2S gas,	-	
		- sulphites, hydrogen sulphites and pyro su	lphites with evolution of toxic SO2 gas,	
		- with sodium azide to highly toxic and explosive hydrazoic acid,		
		- any other chemical, that is prone to (dangerous) reaction/decomposition with acids		
	10.4	Conditions to avoid		
		Exposure to heat and sunlight		
	10.5	Incompatible materials		
		Strong bases, metals		
	10.6	Hazardous decomposition products		
		By heating evolution of corrosive and toxic hydrogen chloride gas		
11		TOXICOLOGICAL INFORMATION		
	11.1	Information on hazard classes as defined i	n Regulation (EC) No 1272/2008	
		Acute toxicity	Tetrachloroauric acid	
			LD50 (oral) (rat): 464 mg/kg bw	
		Skin corrosion / irritation	Corrosive to the skin	
		Serious eye damage/irritation	Risk of serious eye damage.	
		Respiratory or skin sensitization	Rabbit 0.5 ml Cat. 1 (irreversible	
			effects on the eyes)	
		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	May cause irritation/corrosion of	
			lungs and respiratory tract	
		STOT – repeated exposure	May cause kidney damage	
	11.2	Information on other hazards		
		None		



Au chloride solution According to Regulation n. 1907/2006 and Regulation 878/2020 Au chloride solution 200 g Au/l (HAuCl4)

Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

12		ECOLOGICAL INFORMATION			
	12.1	Toxicity	Substance:		
			Tetrachloroauric acid		
			LC50-96h(trout): 15.7 mg/L		
			EC50-48h(daphnia) 1.04 mg/L		
			Mixture:		
			EC50: 4.16 mg/l		
	12.2	Persistence and degradability	It is not biodegradable and		
			dissociates in water. Adsorption /		
			desorption in the soil is impossible.		
	12.3	Bioaccumulative potential	Insignificant given the high solubility		
			in water		
	12.4	Mobility in soil	It does not reach sediment / soil		
			and therefore cannot be ingested by		
			birds or mammals		
	12.5	Results of PBT and vPvB assessmen	t Not applicable		
	12.6	Endocrine disrupting properties	No known effects		
	12.7	Other adverse effects	No known effects		
13	3 DISPOSAL CONSIDERATIONS				
	13.1	Waste treatment methods			
			must be disposed of as hazardous waste by		
	authorized companies.				
14		TRANSPORT INFORMATION			
	14.1	UN number or ID number	3264		
	14.2	Official UN shipping name	Liquid, inorganic, corrosive, acid, n.o.s.		
			(hydrochloric acid, tetrachloroauric acid)		
	14.3	Transport hazard class	-		
		ADR/RID/IMDG/ICAO-IATA: Class:	8		
		ADR/RID/IMDG/ICAO-IATA: Label:	8 + mark environmental hazard		
		ADR: Tunnel restriction code	(E)		
		IMDG - EmS:	F-A, S-B		
	14.4 14.5	Packing group	11		
	14.5	Dangers for the environment	YES		
		ADR/RID/ICAO-IATA: IMDG: Marine Contaminant:	YES		
	14.6	Special precautions for users			
	14.0	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		



Au chloride solution According to Regulation n. 1907/2006 and Regulation 878/2020 Au chloride solution 200 g Au/l (HAuCl4)

Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

			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 according to IMO	No bulk transport is foreseen			
15		REGULATORY INFORMATION				
	15.1					
		for the substance or mixture				
		Reg. (EC) 1907/2006 / EC Reach	EC) 1272/2008 CLP and subsequent changes and additions			
			/2000 "Substances that deplete the ozone layer"			
			0/2004 "Persistent organic pollutants"			
		• • • • • •	589/2008 "export and import of dangerous chemicals"			
			nce listed in Annex I of Dir. 2012/18 / EU so-called Seveso			
		safety at work	egislative Decree 81/2008 Consolidated Law on health and YES			
		Directive 2014/103 / EU "Adr"	•			
			(CE) 1907/2006/CE Reach art. 59 – Candidate List of			
		Substances of Very High Concern (SV				
		Reg. (CE) 1907/2006/CE Reach - An	NO			
		Reg. (CE) 1907/2006/CE Reach - Annex XVII – Restriction List		Restricted use.		
		https://echa.europa.eu/it/substances-restricted-under-reach		ltem 3 - 75		
				(see link)		
	15.2	Chemical safety assessment	•			
		A chemical safety assessment was not carried out				
16		OTHER INFORMATION				
		Changes compared to the previous edition				
		Changes to sections 1-2-3-8-10-11-14-16				
		Acronim and abbreviation legend ADR: European Agreement concerning the International Carriage 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				
		STA: Acute Toxicity Estimate				
		PBT: Persistent, Bioaccumulative and Toxic.				
		vPvB: (very persistent and very bioaccumulative). Very persistent and very				
		bioaccumulative				
		LD: lethal dose				
		PNEC: predicted no effect concentra	ation			
		DNEL: derived no effect level				
		TLV (ceiling value): threshold limit va	aiue			
		STEL: short-term exposure limit EU-OEL: European occupational exp	osure limit			
		TWA: time-weighted average				
		I WA. UNE-WEIGHLEU AVEIAGE				



Au chloride solution According to Regulation n. 1907/2006 and Regulation 878/2020 Au chloride solution 200 g Au/l (HAuCl4)

Revision XI – 21.03.2025 Replaces revision X – 03.07.2023

> EC: effective concentration NOAEL: no observed adverse effect level LC: lethal concentration NOEC: no observed effect concentration LOEC: lowest observed effect concentration Bw: body weight Koc: organic carbon-water partition coefficient Main references and data sources ECHA's data bank on registered substances and soon to be registered substances: https://chem.echa.europa.eu/ Indication, for mixtures, of which methods of evaluation of the information have been used for the purposes of classification Classification **Classification procedure** Met Corr Calculation method 1 AcuteTox. 4 Calculation method According to 3.3.3.1.2 of Annex I to CLP Skin Corr. 1 Eye Dam. 1 According to 3.3.3.1.2 of Annex I to CLP STOT SE 3 Calculation method STOT RE 2 Calculation method Aquatic Chronic 2 Calculation method

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

- Chemical Risk Training pursuant to Legislative Decree 81/08 Title IX dangerous substances
- PPE training