ID Card
Tetrachloroauric acid

Version 4 July 2023

Notes:

- *This ID card is used to support the substance sameness discussions in SIEFs and to describe the substance to the best of the SIEF members' knowledge.*
- *It also aims at grouping communications relevant to the request of available data or information, the approval of the proposed Lead Registrant and the registration strategy with the SIEF.*
- *It is the responsibility of each individual registrant to identify their substance and to report company-specific identity in their Registration Dossier (section 1 of IUCLID).*

1. Identification of the substance

Table 1. Identification of the substance

	Original (in EC inventory)
Name	Tetrachloroauric acid
EC number	240-948-4
CAS number	16903-35-8
Description	Not available
Composition type	Mono-constituent substance

2. Synonyms and other identifiers of the substance

Table 2. Synonyms and other identifiers of the substance

IUPAC name	Tetrachloroauric acid
CAS name	
Abbreviations	TCA
Other commercial, brand or international names	Trichlorogold Gold(III) chloride Hydrogenchloroaurate(III) hydrate Auric chloride Aurochloric acid Chloroauric acid

	Chlorauric acid Auric acid (HAuCl4) Hydrogen tetrachloroaurate Aurate(1-), tetrachloro-, hydrogen Brown gold chloride Gold chloride (AuCl3), hydrochloride Gold hydrogen chloride Gold tetrachloride
Other identity codes	EINECS 240-948-4

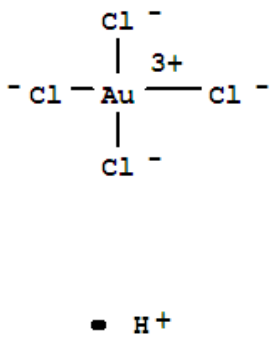
3. Substances (with core identifiers) also falling under this substance (with justification)

Table 3. Substances also falling under this substance

Name	EC number	CAS number	Justification
Tetrachloroauric acid hydrate		27988-77-8	Hydrated form of Tetrachloroauric acid

4. Information related to molecular and structural formula of the substance

Table 4. Information related to molecular and structural formula of the substance

Molecular formula	AuCl4.H
Structural formula	
Smiles notation	[H+].Cl[Au-](Cl)(Cl)Cl
Optical activity	
Typical ratio of (stereo) isomers	*Specify isomers + range*
Molecular Weight / Molecular Weight range	339,79 g/mol (anhydrous)

5. Typical composition of the substance

Tetrachloroauric acid is only placed on the market in hydrated form. All forms of Tetrachloroauric acid will be addressed in the same Registration Dossier but are reported individually in IUCLID section 1.2.

Table 5. Typical composition

	Name	Symbol / Formula	Min & Max concentrations (%)	Typical concentration (range) (%)
Main constituent(s)*	Tetrachloroauric acid hydrate	H[AuCl4] x n H2O with n=1-3	99 - 100	>99
Additive(s)**				
Main impurity(-ies)#	Several minor (especially metallic) impurities which do not affect the classification of the substance because of their non-hazardous nature or because they do not exceed the classification cut-off limits in the substance	e.g. Ag, Ca, Cu, Fe, Mg, Pd, Pt, Rh, Si	0 - 1	<1
Other impurities##				

* ≥ 80 % (w/w) for mono-constituent substances; ≥ 10 % (w/w) and < 80 % (w/w) for multi-constituent substances.

** ≥ 1 % (or lower if contributing to the hazard). An additive is a substance that has been intentionally added to stabilise the substance and which cannot be removed without changing the chemical nature to which it is added.

≥ 1 %. An impurity is an unintended constituent present in a substance, as produced. It may originate from the starting materials or be the result of secondary or incomplete reactions during the production process. While impurities are present in the final substance, they were not intentionally added.

< 1 % and potentially influencing the classification of the substance.

The composition given above is typical and should therefore represent the majority of Tetrachloroauric acid as manufactured and/or imported in the EEA market. Tetrachloroauric acid containing less than <typical concentration> <main constituent> may still be considered to be the same for the purpose of registration under REACH and may be referred to as impure Tetrachloroauric acid to distinguish if from the typically pure Tetrachloroauric acid.

6. Information on appearance, physical state and properties of the substance

Table 6. Appearance / physical state / properties of the solid substance

Physical state	Solid
Physical form*	Crystalline
Appearance	Golden to yellowish brown crystals or powder
Particle size**	Coarse powder
Does the substance contain 'bound water'?#	Yes / No. If yes, indicate range (%)
Does the substance contain 'crystallisation water'?#	Yes (xH_2O, $x \leq 3$)
Does the solid hydrolyse?##	No
Is the solid hygroscopic?§	Yes

* Crystalline form: solid material whose constituent atoms, molecules, or ions are arranged in an ordered pattern extending in all three spatial dimensions. Amorphous form: solid material whose constituent atoms, molecules, or ions are randomly arranged.

** Nanoform: particles in the size range 1 - 100 nm (for definition of a nanomaterial, see http://ec.europa.eu/environment/chemicals/nanotech/faq/definition_en.htm). Fine powder: particles in the size range 100 – 2.500 nm. Coarse powder: particles in the size range 2.500 nm – 1 mm. Massive object: particles in the size range > 1 mm.

'Bound water': water molecules that are coordinated as bound ligands. 'Crystallisation water' or hydration water: water that occurs in crystals (necessary for the maintenance of crystalline properties) but which is not directly bound to the metal ion (a hydrate contains a definite % of crystallisation water e.g. CuSO4 x 5 H2O, an anhydride does not contain any water)

Hydrolysis: decomposition (cleavage of chemical bonds) by the addition of water.

§ Hygroscopic substance: readily attracts moisture from its surroundings in open air, through either absorption or adsorption.

Table 7. Appearance / physical state / properties of the substance in solution*

Physical state	Solution
Solvent	Water
Concentration range of substance in solution	15 - 75 % (w/w)
pH (range) of the solution	≤1
Excess acid	Hydrochloric acid 0-5%

* For liquid substances (solvent cannot be separated from substance without changing the identity of the substance) and not for mixtures, suspensions, and other non-substance forms in which the substance is manufactured and/or imported under REACH .

7. Analytical data

Annex VI of REACH requires the registrant to describe the analytical methods and/or to provide the bibliographical references for the methods used for identification of the substance and, where appropriate, for the identification of impurities and additives. This information should be sufficient to allow the methods to be reproduced.

Table 8. Analytical methods for identification of the substance

Parameter / Method	Recommended for substance identification and sameness check	Applicable	Not applicable or not recommended
Elemental analysis			
ICP (ICP-MS or ICP-OES)	**X**		
Atomic absorption spectroscopy (AAS)			
Glow discharge mass spectrometry (GDMS)			
Molecular analysis			
Infrared (IR) spectroscopy	**X (solid)**		
Raman spectroscopy	**X (solution)**		
Mineralogical analysis			
X-Ray Fluorescence (XRF)	**X**		
X-Ray Diffraction (XRD)	**X**		
Morphology and particle sizing			
Electron microscopy (SEM, TEM, REM)* #			
Laser diffraction* #			
Particle size by other means (e.g. sieve analysis)#			
Surface area by N-BET* #	**X (solid)**		
Other			

* Analytical techniques particularly (but not exclusively) relevant for nanomaterials.

The choice of the technique for particle size depends on the size of the material as manufactured/imported/placed on the market/used.

Tetrachloroauric acid - Analytical Reference Information

Tetrachloroauric acid, solid

- Instrument: Bruker Tensor 37
- Measurement head: Diamond ATR
- Resolution: 2 cm-1
- Sample scans: 16
- Background scans: 16
- Atmospheric compensation: Off
- Result spectrum: Absorbance
- Source: MIR
- Beam splitter: KBr
- Aperture: 5 mm
- Detector: DLaTGS
- Detector temperature: Ambient
- Scanner velocity: 10 kHz

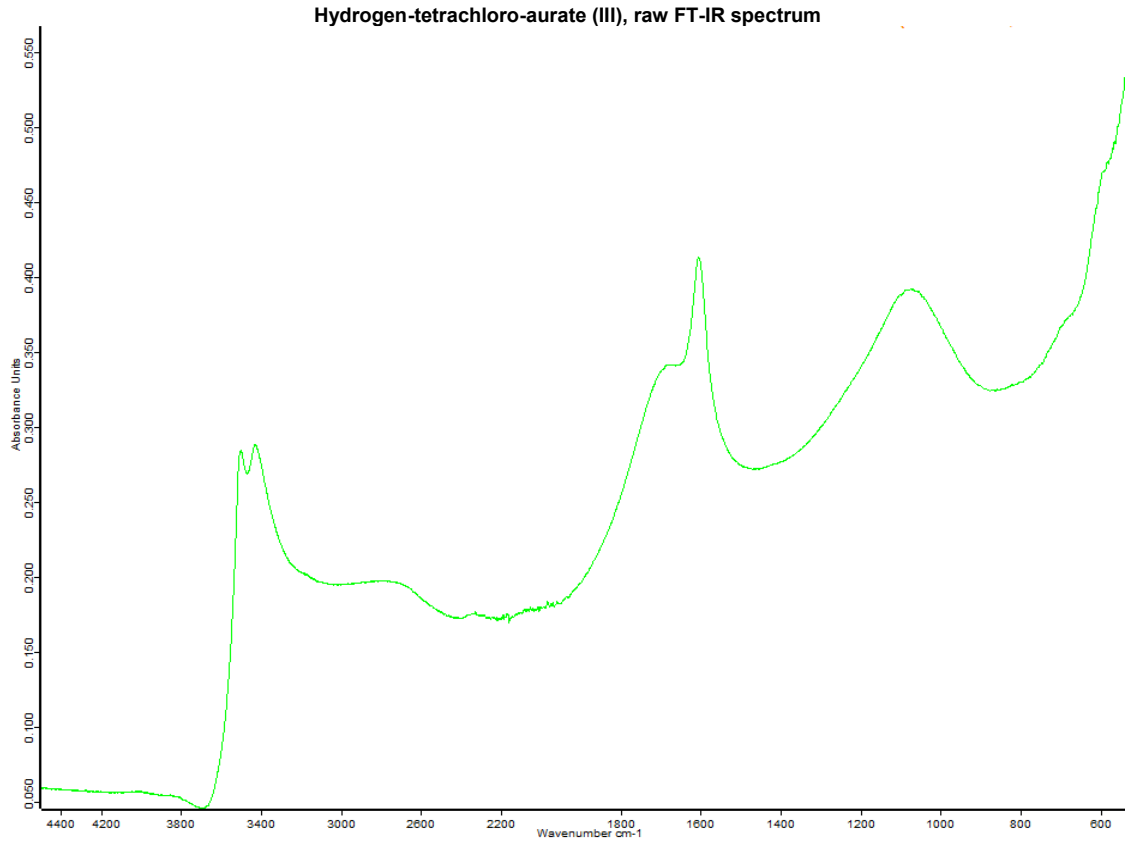


Figure 1: FT-IR spectra of solid tetrachloroauric acid, hydrate.

Tetrachloroauric acid, solution

- Instrument: RFS100
- Resolution: 2 cm^{-1}
- Sample scans: 100
- Laser: 1003 mW
- Result spectrum: Raman Intensity

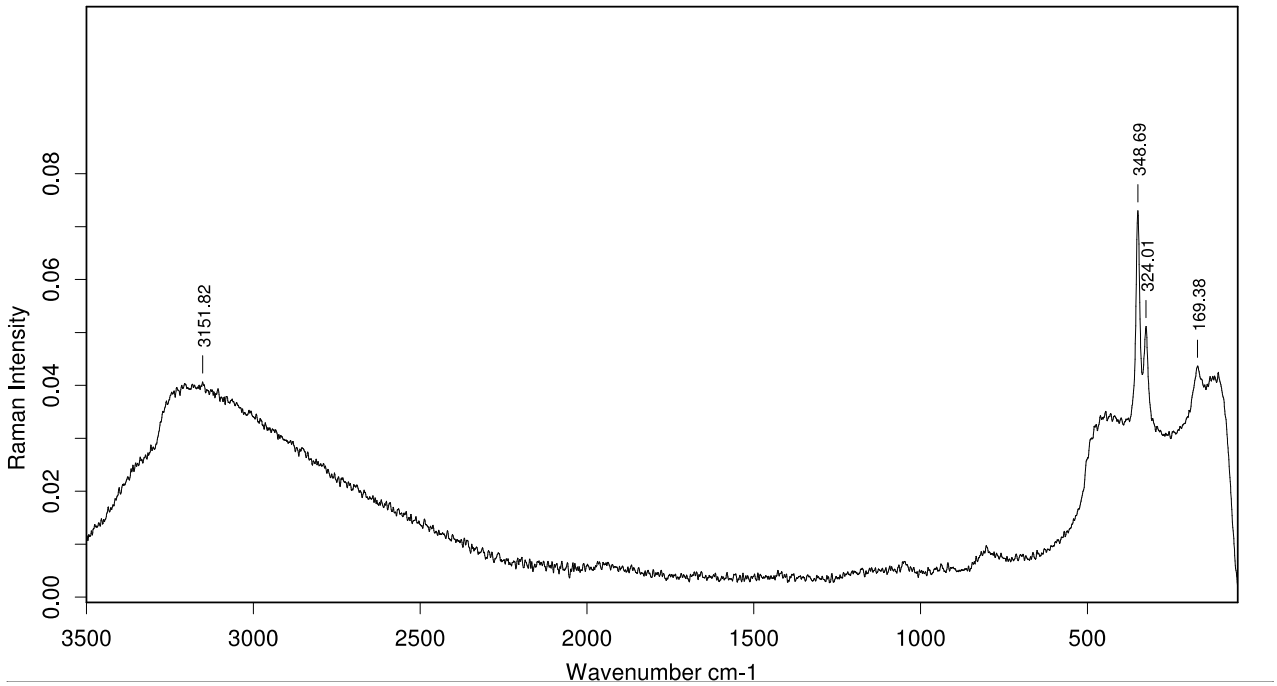


Figure 2: RAMAN spectra of Tetrachloroauric acid solution.

8. Lead Registrant

Johnson Matthey Plc (United Kingdom) volunteers to be the Lead Registrant for Tetrachloroauric acid. The EPMF will provide support to the Lead Registrant as laid down in the EPMF Agreement.

9. Scope of the Registration Dossier

The uses included in this Registration Dossier are listed on the EPMF website.