



ID Card

Dirhodium trisulphate

Version 18 July 2023

Notes:

- This ID card is used to support the substance sameness discussions and to describe the substance to the best of the 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.
- 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).

DISCLAIMER

All data and information contained in this document shall be treated by the receiving party (i) in full confidence with the adequate respect of any confidential and/or proprietary nature of such information and (ii) only in the framework of the purpose of agreeing on substance sameness, Lead Registrant and overall REACH Strategy for the concerned Substance under REACH (the 'Purpose').

The receiving party (and any representative) shall not be allowed to use or circulate any or all parts of this document for any other purpose than the Purpose, without the prior written consent of the European Precious Metals Federation (EPMF).

The content provided in this document is given for the Purpose and as such, no guarantee or warranty whatsoever (expressed or implied) is given as to its accuracy, completeness, merchantability or fitness for any particular purpose which the receiving party may have. In any case, any use by the receiving party would be made at its sole risk and liability.

1. Identification of the substance

Table 1. Identification of the substance

	Original (in EC inventory)
Name	Dirhodium trisulphate
EC number	234-014-5
CAS number	10489-46-0
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	Rhodium(3+);trisulfate
CAS name	Sulfuric acid, rhodium(3+) salt (3:2)
Abbreviations	
Other commercial, brand or international names	Rhodium(III) sulphate Rhodium(III) sulfate Rhodium(3+) sulfate(2:3) Sulfuric acid, rhodium(3+) salt (3:2) Dirhodium trisulfate
Other identity codes	

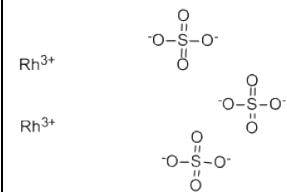
3. Substances (with core identifiers) also falling under this substance (with justification)

Table 3. Substances also falling under this substance

Name	EC number	CAS number	Justification
Dirhodium trisulphate tetrahydrate		15274-78-9	According to Annex V(6) of the REACH Regulation, hydrates of a substance are exempted from Registration provided that the anhydrous form has been registered by the manufacturer or importer using this exemption.

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	$Rh_2(SO_4)_3$
Structural formula	
Smiles notation	[O-]S(=O)(=O)[O-].[O-]S(=O)(=O)[O-].[O-]S(=O)(=O)[O-].[Rh+3].[Rh+3]
Optical activity	
Typical ratio of (stereo) isomers	
Molecular Weight / Molecular Weight range	494,00 g/mol (anhydrous base)

5. Typical composition of the substance

Dirhodium trisulphate can be produced in anhydrous and hydrated form. All forms of Dirhodium trisulphate will be addressed in the same Registration Dossier but are reported individually in IUCLID section 1.2.

Table 5. Typical composition (anhydrous base)

	Name	Symbol / Formula	Min & Max concentrations (%) [§]	Typical concentration (%) ^{§§}
Main constituent(s)*	Dirhodium trisulphate	$Rh_2(SO_4)_3$	80-100	81 [§]
Impurities[#]	Water	H ₂ O	0 - 10	7
	Sulphuric acid	H ₂ SO ₄	0 - <15	12
	Chloride	Cl ⁻	0 - 1	< 1



	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, Au, Cu, Ir, Pd, Pt, Ru	0 – 1	< 1
--	---	---------------------------------	-------	-----

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

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.

§ Concentration ranges define the substance sameness criteria agreed by all EPMF Members in preparation of the communication with other SIEF members.

§§ Typical concentration refers to the representative sample used for testing.

§ Corresponds to 33,6 % Rh.

The composition given above is typical and should therefore represent the majority of Dirhodium trisulphate (anhydrous) as manufactured and/or imported in the EEA market.

Table 6. Typical composition (hydrate)

	Name	Symbol / Formula	Min & Max concentrations (%) [§]	Typical concentration (%) ^{§§}
Main constituent(s)*	Dirhodium trisulphate tetrahydrate	$\text{Rh}_2(\text{SO}_4)_3 \cdot 4\text{H}_2\text{O}$	85 – 100	92 [§]
Impurities#	Water	H_2O	0 – 9	3
	Sulphuric acid	H_2SO_4	0 - <15	5
	Chloride	Cl^-	0 – 1	< 1
	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, Au, Cu, Ir, Pd, Pt, Ru	0 – 1	< 1

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

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.

§ Concentration ranges define the substance sameness criteria agreed by all EPMF Members in preparation of the communication with other SIEF members.

§§ Typical concentration refers to the representative sample used for testing.

§ Corresponds to 33,6 % Rh.

The composition given above is typical and should therefore represent the majority of Dirhodium trisulphate (hydrate) as manufactured and/or imported in the EEA market.

The compositions given above are the compositions of the solid Dirhodium trisulphate and Dirhodium trisulphate tetrahydrate as manufactured and/or imported in the EEA market. In practice, Dirhodium trisulphate is only brought on the market in a diluted sulphuric acid ($\text{H}_2\text{O} + \text{H}_2\text{SO}_4$) solution usually with 1,9 – 9,5 % Rh content. An excess sulfuric acid is required to keep the substance in solution stable.

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

Table 7. Appearance / physical state / properties of Dirhodium trisulphate as mono-constituent substance

Physical state	Solid / viscous / liquid, depending on content of sulphuric acid
Physical form*	Crystalline / crystal mush / solution, depending on content of sulphuric acid
Appearance	Crystalline: red-yellow / crystal mush: orange-brown / liquid: brown
Particle size**	Not applicable
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 full definition of a nanomaterial, see <http://ec.europa.eu/environment/chemicals/nanotech/index.htm#definition>). 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.

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. Cf. also water/moisture content in Table .

Table 8. Appearance / physical state / properties of Dirhodium trisulphate in solution*

Physical state	Solution
Solvent	Diluted sulphuric acid (H ₂ O + H ₂ SO ₄)
Concentration range of substance in solution	4,5 – 22,8% (corresponds to 1,9 - 9,5% Rh content)
pH (range) of the solution	<1
Excess acid	H ₂ SO ₄ : 2 – 16 %

* 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 7. 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			
Raman spectroscopy	X		
Mineralogical analysis			
X-Ray Fluorescence (XRF)			X
X-Ray Diffraction (XRD)			X
Morphology and particle sizing			
Electron microscopy (SEM, TEM, REM)* #			X
Laser diffraction* #			X
Particle size by other means (e.g. sieve analysis)#			X
Surface area by N-BET* #			X
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.

8. Lead Registrant

Umicore AG&Co.KG (Germany) is the Lead Registrant for Dirhodium trisulphate. 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](#).

10. Analytical reference information

Below the results of Raman analysis of a reference sample used for testing.

Spectrometer: Bruker RFS 100/S

Laser: NdYAG 1064 nm

Spectral range: 3500 – 50 cm⁻¹

Resolution: 2 cm⁻¹

Scans: 100 scans

Temperature: ambient

Sample preparation: liquid phase, glass vial, closed

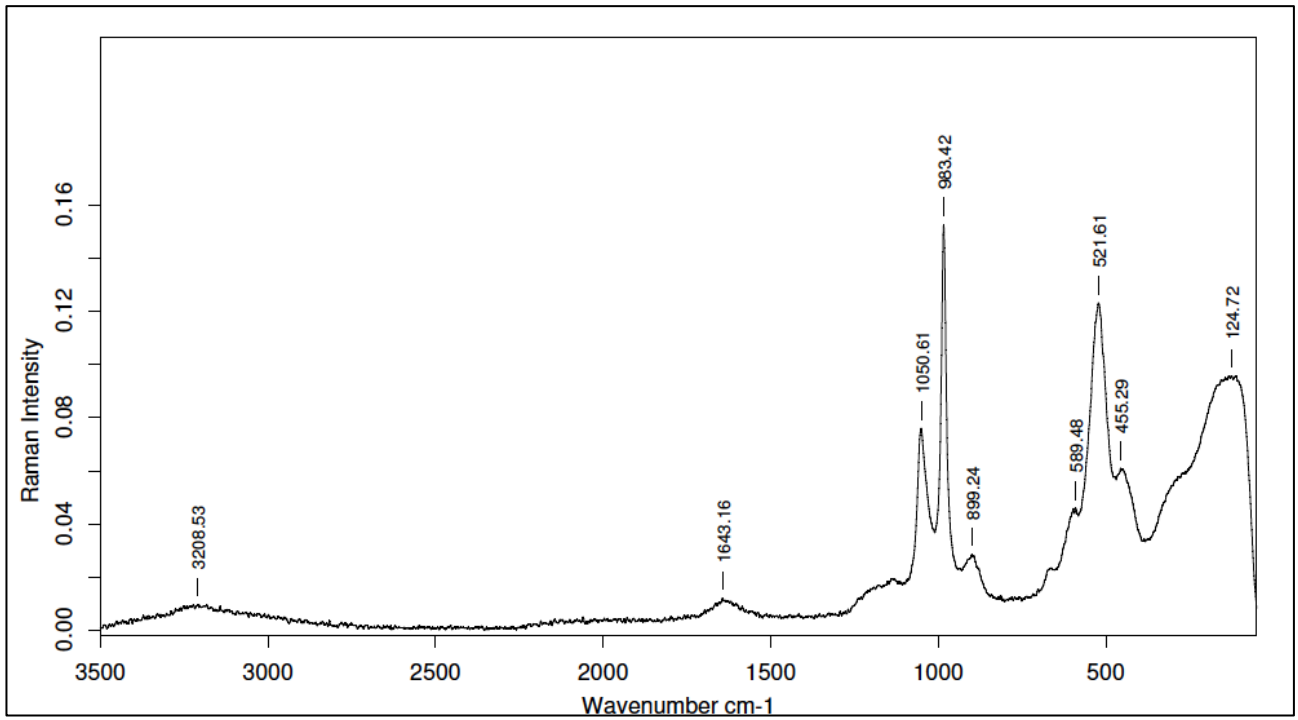


Figure 1. Raman spectrum of Rhodium trisulphate solution