



# ID Card

## Rhodium trichloride (hydrate)

Version 18 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).

### DISCLAIMER

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## 1. Identification of the substance

Table 1. Identification of the substance

	Original (in EC inventory)
Name	Rhodium trichloride hydrate
EC number	606-630-8
CAS number	20765-98-4
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	Trichlororhodium hydrate (1:1)
CAS name	Rhodium chloride (RhCl <sub>3</sub> ), hydrate (9Cl)
Abbreviations	
Other commercial, brand or international names	Rhodium chloride hydrate Rhodium(III) chloride hydrate
Other identity codes	PubChem ID: 16211510

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

**Table 3. Substances also falling under this substance**

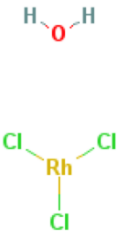
Name	EC number	CAS number	Justification
Rhodium trichloride trihydrate		13569-65-8	Rhodium trichloride (hydrate) is a mixture of different hydrates ( $\text{RhCl}_3 \cdot x\text{H}_2\text{O}$ with $x=1-3$ ). The substance is registered under the CAS number of the mixture of hydrates, but the registration also covers the trihydrate.

**Note:** Under REACH, it is generally recognized that the anhydrous and hydrated forms of a substance are in most cases regarded as the same substance (despite potentially having different CAS numbers). As such, they are mostly covered by the same REACH dossier. However, experts of the EPMF concluded during substance ID discussions that Rhodium trichloride is an exception to this rule: Rhodium trichloride (hydrate) is not the same substance as Rhodium trichloride (anhydrous). The 'hydration water' in Rhodium trichloride (hydrate) is not bound via hydrogen bonds to the metal ion, as is the case in 'common' hydrates, but is coordinated to the metal to form water soluble chloro-aqua complexes. The anhydrous forms are very low solubility chloro-bridged polymers/oligomers. Because of this different chemical structure of the hydrated vs anhydrous form, the substance properties differ and both forms need registration in different REACH dossiers.

It was confirmed by the EPMF membership that only the hydrated form is currently of commercial relevance and requires REACH registration.

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

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

<b>Molecular formula</b>	$\text{RhCl}_3 \cdot x\text{H}_2\text{O}$ with x ranging from 1-3
<b>Structural formula</b>	
<b>Smiles notation</b>	<chem>O.Cl[Rh](Cl)Cl</chem>
<b>Optical activity</b>	Not applicable
<b>Typical ratio of (stereo) isomers</b>	Not applicable
<b>Molecular Weight / Molecular Weight range</b>	227,28 g/mol (monohydrate) – 263,31 g/mol (trihydrate)

## 5. Typical composition of the substance

**Table 5. Typical composition**

	Name	Symbol / Formula	Min & Max concentrations (%) <sup>§</sup>	Typical concentration (%) <sup>§§</sup>
<b>Main constituent(s)*</b>	Rhodium trichloride hydrate	RhCl <sub>3</sub> .xH <sub>2</sub> O	84 - 100	94,7
<b>Impurities<sup>#</sup></b>	Chloric acid	HCl	0 - 15	5,2
	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	≤ 0,1

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

<sup>#</sup> 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.

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

<sup>§§</sup> Typical concentration refers to the representative sample used for testing.

<sup>§</sup> Corresponds to 39 - 40 % Rh.

The composition given above is typical and should therefore represent the majority of Rhodium trichloride (hydrate) as manufactured and/or imported in the EEA market. Rhodium trichloride (hydrate) containing less than 99% Rhodium trichloride (hydrate) may still be considered to be the same for the purpose of registration under REACH and may be referred to as impure Rhodium trichloride (hydrate) to distinguish it from the typically pure Rhodium trichloride (hydrate).

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

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

<b>Physical state</b>	Solid
<b>Physical form*</b>	Crystalline
<b>Appearance</b>	Dark red to red-brown powder
<b>Particle size**</b>	Fine to coarse powder
<b>Does the solid hydrolyse?#</b>	No
<b>Is the solid hygroscopic?§</b>	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.

<sup>#</sup> 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 5.

## 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
<b>Elemental analysis</b>			
ICP (ICP-MS or ICP-OES)	X		
Atomic absorption spectroscopy (AAS)			
Glow discharge mass spectrometry (GDMS)			
<b>Molecular analysis</b>			
Infrared (IR) spectroscopy	X		
Raman spectroscopy			
<b>Mineralogical analysis</b>			
X-Ray Fluorescence (XRF)		X	
X-Ray Diffraction (XRD)	X		
<b>Morphology and particle sizing</b>			
Electron microscopy (SEM, TEM, REM)* #			
Laser diffraction* #	X		
Particle size by other means (e.g. sieve analysis)#			
Surface area by N-BET* #	X		
<b>Other</b>			

\* 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

Heraeus Deutschland GmbH & Co. KG (Germany) volunteers to be the Lead Registrant for Rhodium trichloride (hydrate). 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 IR analysis of a reference sample used for testing.

Spectrometer: Infrared spectrometer Tensor 27

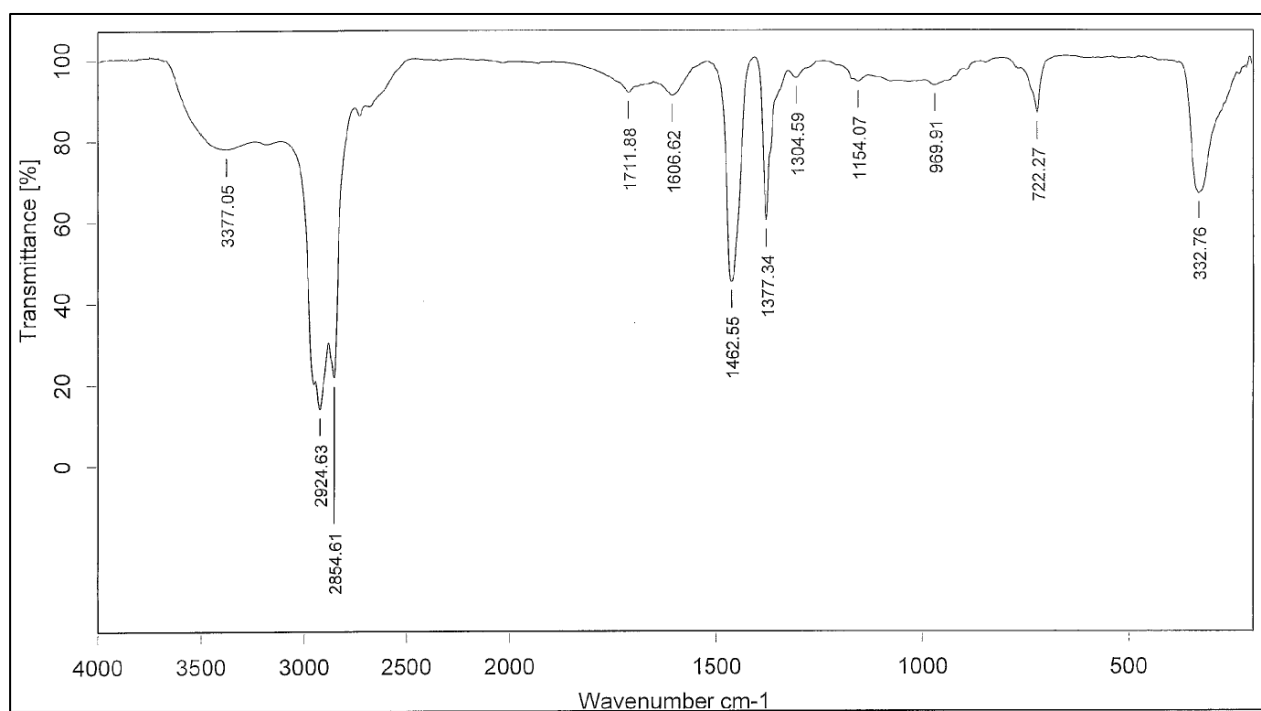
Spectral Range: 4000 – 200 cm<sup>-1</sup>

Resolution: 2 cm<sup>-1</sup>

Scans: 32

Temperature: ambient

Sample preparation: Nujol mull, undefined layer CsJ



**Figure 1. IR spectrum of Rhodium trichloride (hydrate)**