

ID Card

Tetraamminepalladium(2+) dihydroxide (in solution)

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	Tetraamminepalladium(2+) dihydroxide
EC number	270-241-6
CAS number	68413-68-3
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

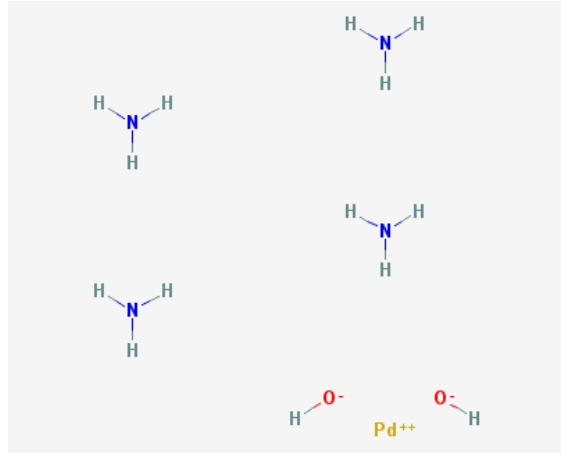
IUPAC name	Azane;palladium(2+);dihydroxide
CAS name	
Abbreviations	
Other commercial, brand or international names	Palladium(2+) hydroxide ammoniate (1:2:4) Tetraamminepalladium dihydroxide Tetramminepalladium (II) hydroxide
Other identity codes	PubChem ID: 6456004

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

None

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

Table 3. Information related to molecular and structural formula of the substance

Molecular formula	H14N4O2Pd
Structural formula	
Smiles notation	N.N.N.N.[OH-].[OH-].[Pd+2]
Optical activity	
Typical ratio of (stereo) isomers	
Molecular Weight / Molecular Weight range	208,56 g/mol

5. Typical composition of the substance

Table 4. Typical composition

	Name	Symbol / Formula	Min & Max concentrations (%)^s	Typical concentration (%)^{ss}
Main constituent(s)*	Tetraamminepalladium(2+) dihydroxide	H14N4O2Pd	→=99.5 - <=100% ^s	99.9
	Water		86 - 94	93
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, Au, Cu, Ir, Pb, Pt, Rh, Ru	>=0 - <=0.5%	0.1

* ≥ 80 % (w/w) for mono-constituent substances; ≥ 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 registrants..

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

§ Corresponds to 51% Pd.

The information of the boundary composition refers to the composition of solid Tetraamminepalladium(2+) dihydroxide. Although solid Tetraamminepalladium(2+) dihydroxide can be isolated, protective gas atmosphere is needed to keep it stable. Under normal atmospheric conditions Tetraamminepalladium(2+) dihydroxide reacts with carbon dioxide under formation of Tetraamminepalladium hydrogencarbonate.

In practice Tetraamminepalladium(2+) dihydroxide is put on the market in an aqueous solution containing up to a maximum of 14 % (w/w) of Tetraamminepalladium(2+) dihydroxide.

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

Table 5. Appearance / physical state / properties of the substance in solution

Physical state	Solution
Solvent	aqueous alkaline solution
Concentration range of substance in solution	≥ 0.5 – ≤ 14 % [§]
pH (range) of the solution	
Excess acid	

§ Corresponds to 0.3 - 7 % Pd.

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 6. 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)			
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

Heraeus Deutschland GmbH & Co. KG (Germany) is the Lead Registrant for Tetraamminepalladium(2+) dihydroxide. 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: 500 scans

Temperature: ambient

Sample preparation: liquid phase (water), glass vial, closed

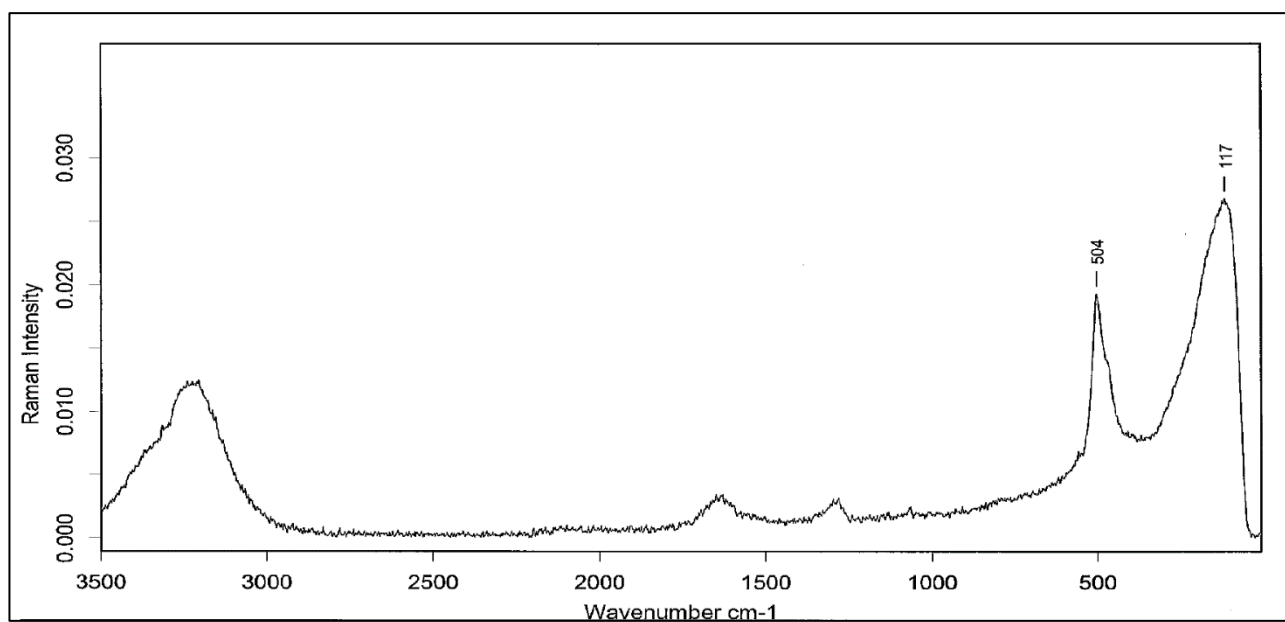


Figure 1. Raman spectrum of Tetraamminepalladium(2+) dihydroxide solution