



# ID Card

## Palladium monoxide

Version 18 October 2018

**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**

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').

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### 1. Identification of the substance

**Table 1. Identification of the substance**

	Original (in EC inventory)
<b>Name</b>	Palladium monoxide
<b>EC number</b>	215-218-3
<b>CAS number</b>	1314-08-5
<b>Description</b>	Not available
<b>Composition type</b>	Mono-constituent substance

### 2. Synonyms and other identifiers of the substance

**Table 2. Synonyms and other identifiers of the substance**

<b>IUPAC name</b>	Oxopalladium
<b>CAS name</b>	
<b>Abbreviations</b>	
<b>Other commercial, brand or international names</b>	Palladium oxide Palladium(II) oxide Oxopalladium
<b>Other identity codes</b>	PubChem ID: 5083724



### 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
Palladium oxide hydrate	613-470-2	64109-12-2	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**

<b>Molecular formula</b>	PdO (anhydrous basis)
<b>Structural formula</b>	PdO
<b>Smiles notation</b>	O=[Pd]
<b>Optical activity</b>	Not applicable
<b>Typical ratio of (stereo) isomers</b>	Not applicable
<b>Molecular Weight / Molecular Weight range</b>	122,42 g/mol (anhydrous basis)

### 5. Typical composition of the substance

Palladium monoxide can be placed on the market in anhydrous and hydrated form. All forms of Palladium monoxide will be addressed in the same Registration Dossier but are reported individually in IUCLID section 1.2.

#### 5.1. Palladium monoxide (anhydrous)

**Table 5. Typical composition**

	Name	Symbol / Formula	Min & Max concentrations (%) <sup>§</sup>	Typical concentration (%) <sup>§§</sup>
<b>Main constituent(s)*</b>	Palladium monoxide	PdO	99,8 - 100 <sup>§</sup>	> 99,8
<b>Impurities<sup>#</sup></b>	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, Pt, Rh, Ru	0 – 0,2	< 0,2

\* ≥ 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 Consortium 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 86,8 – 87,1 % Pd.



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

## 5.2. Palladium monoxide hydrate

**Table 6. Typical composition**

	Name	Symbol / Formula	Min & Max concentrations (%) <sup>§</sup>	Typical concentration (%) <sup>§§</sup>
<b>Main constituent(s)*</b>	Palladium monoxide hydrate	PdO.1H <sub>2</sub> O	99,8 - 100	> 99,8
<b>Impurities<sup>#</sup></b>	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, Pt, Rh, Ru	0 – 0,2	< 0,2

\* ≥ 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.

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

The composition given above is typical and should therefore represent the majority of Palladium monoxide hydrate as manufactured and/or imported in the EEA market.

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

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

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

\* 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.

<sup>§</sup> Hygroscopic substance: readily attracts moisture from its surroundings in open air, through either absorption or adsorption. Cf. also water/moisture content in

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### 6.1. Palladium monoxide (anhydrous)



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 8. 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

Hereaus Deutschland GmbH & Co. KG (Germany) volunteers to be the Lead Registrant for Palladium monoxide. The EPMF will provide support to the Lead Registrant as laid down in the EPMF Agreement.

## 9. REACH Strategy

The table below presents the overall Registration Strategy for Palladium monoxide based on the information available to the EPMF by the date given above on the document.



The Registration Dossier will be prepared for the highest substance status (information requirements associated to a substance or Article 10 Registration being higher than an intermediate handled under strictly controlled conditions or Article 17 or 18 one) and associated tonnage band.

The recap below therefore reflects the scope of work of the EPMF for Palladium monoxide and sets the minimum and maximum set of information that will be gathered and/or produced when preparing the Registration Dossier for Palladium monoxide as described in this ID Card.

If higher information requirements are necessary, these can be included in the Registration dossier (if EPMF is made aware of these additional requirements in-time) as an update to the already submitted dossier.

**Table 9. REACH strategy for the substance (basis for REACH Registration preparation)**

Item	Description
<b>REACH category</b>	Mono-constituent substance
<b>Highest status</b>	Substance
<b>Highest tonnage band</b>	1-10 t/a
<b>Information requirements</b>	Available / Existing + Annex VII
<b>Existing classification*</b>	<a href="#">Oxidizing solid cat 1 (H271)</a>
<b>Registration deadline</b>	2018

\* For the pure form, as in the REACH registration dossier

## 10. Scope of the Registration Dossier

The uses included in this Registration Dossier are listed on the [EPMF website](#).

## 11. Analytical reference information

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

Spectrometer: Infrared spectrometer Tensor 27  
Spectral Range: 4000 – 300 cm<sup>-1</sup>  
Resolution: 2 cm<sup>-1</sup>  
Scans: 32  
Temperature: ambient  
Sample preparation: Nujol mull, undefined layer CsJ

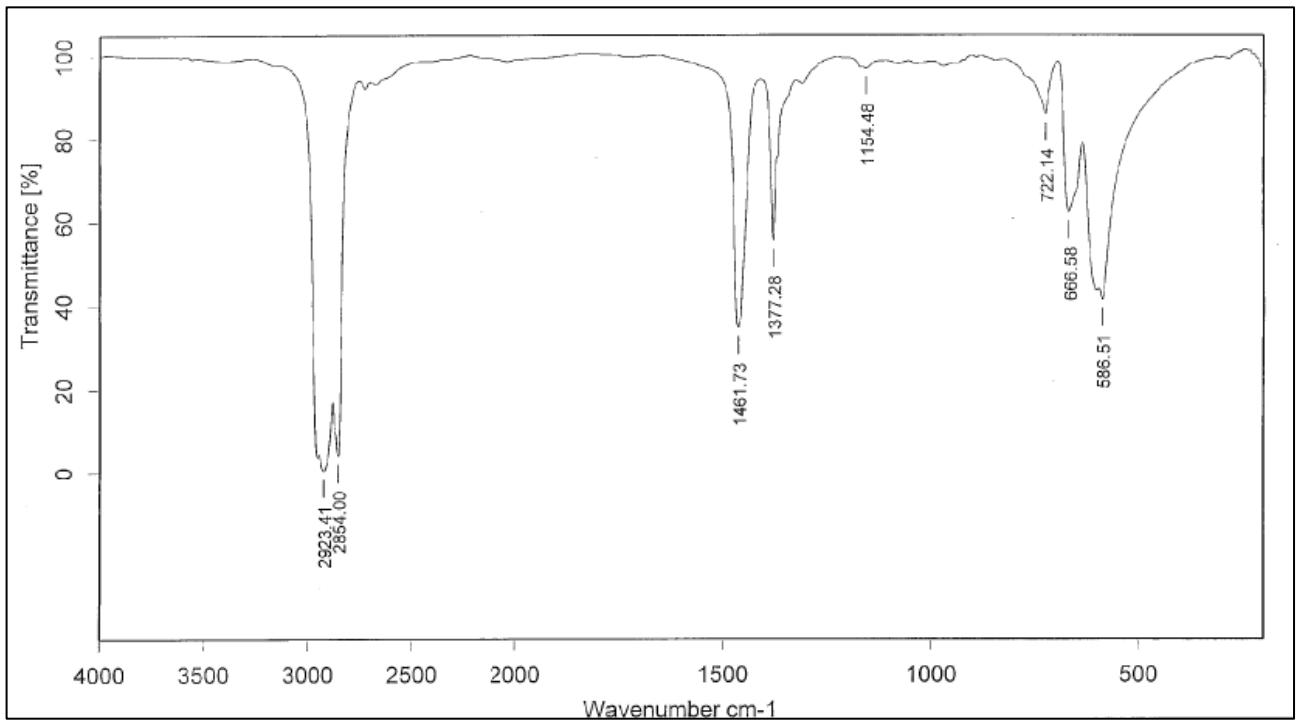


Figure 1. IR spectrum of Palladium monoxide (anhydrous)