ID Card
Palladium dichloride

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).*

1. Identification of the substance

Table 1. Identification of the substance

	Original (in EC inventory)
Name	Palladium dichloride
EC number	231-596-2
CAS number	7647-10-1
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

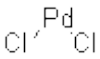
IUPAC name	Palladium(2+) dichloride
CAS name	Palladium chloride
Abbreviations	
Other commercial or international names	Palladium chloride Palladium (II) dichloride Dichloropalladium Palladium(2+) chloride Palladium chloride (2+)
Other identity codes	None

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	Cl2Pd
Structural formula	
Smiles notation	[Cl-].[Cl-].[Pd+2]
Optical activity	Not applicable
Typical ratio of (stereo) isomers	Not available
Molecular Weight / Molecular Weight range	177,33 g/mol

5. Typical composition of the substance

Table 4. Typical composition

	Name	Symbol / Formula	Min & Max concentrations (%)§	Typical concentration (%)§§
Main constituent(s)*	Palladium dichloride	Cl2Pd	99 - 100$	> 99
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 - 1	< 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 Consortium Members in preparation of the communication with other SIEF members.

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

$ Corresponds to 59,4 - 60 % Pd.

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

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

Table 5. Appearance / physical state / properties of the solid substance

Physical state	Solid
Physical form*	Crystalline
Appearance	Red to brown powder
Particle size**	Fine to coarse powder
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 water from its surroundings, through either absorption or adsorption. Cf. also water/moisture content in Table 4.

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	X		
Raman spectroscopy			
Mineralogical analysis			
X-Ray Fluorescence (XRF)		X	
X-Ray Diffraction (XRD)	X		
Morphology and particle sizing			

Electron microscopy (SEM, TEM, REM)* #			
Laser diffraction* #	X		
Particle size by other means (e.g. sieve analysis)#			
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

BASF (Italia) volunteers to be the Lead Registrant for Palladium dichloride. 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 (Palladium dichloride solution) and XRD (Palladium dichloride solid) analyses of a reference sample used for testing.

Raman spectroscopy

Apparatus: Raman WITec Alpha 300R

Nd: YAG Laser Compass 315-50 (532 nm)

Sample preparation: For measurement the neat test item (stored in a glass vial) was positioned in a holder of the macro sampling set. After maximizing the signal intensity of the test item's Raman bands at 275 cm-1 and at 331 cm-1, respectively, a Raman spectrum was recorded.

Test parameters: Spectral range: 98.86 cm-1 - 3649.78 rel. cm-1

Resolution: < 6 cm-1 (not linear)

Excitation wavelength: 532.260 nm

Grating: T1: 600grids/mm BLZ=500 nm

No. of accumulations: 60

Integration time: 1.00002s

Lens: Renishaw Macro Sampling Set, (90° adaptor, lens f = 30mm NA = 0.17)

Measurement at room temperature.

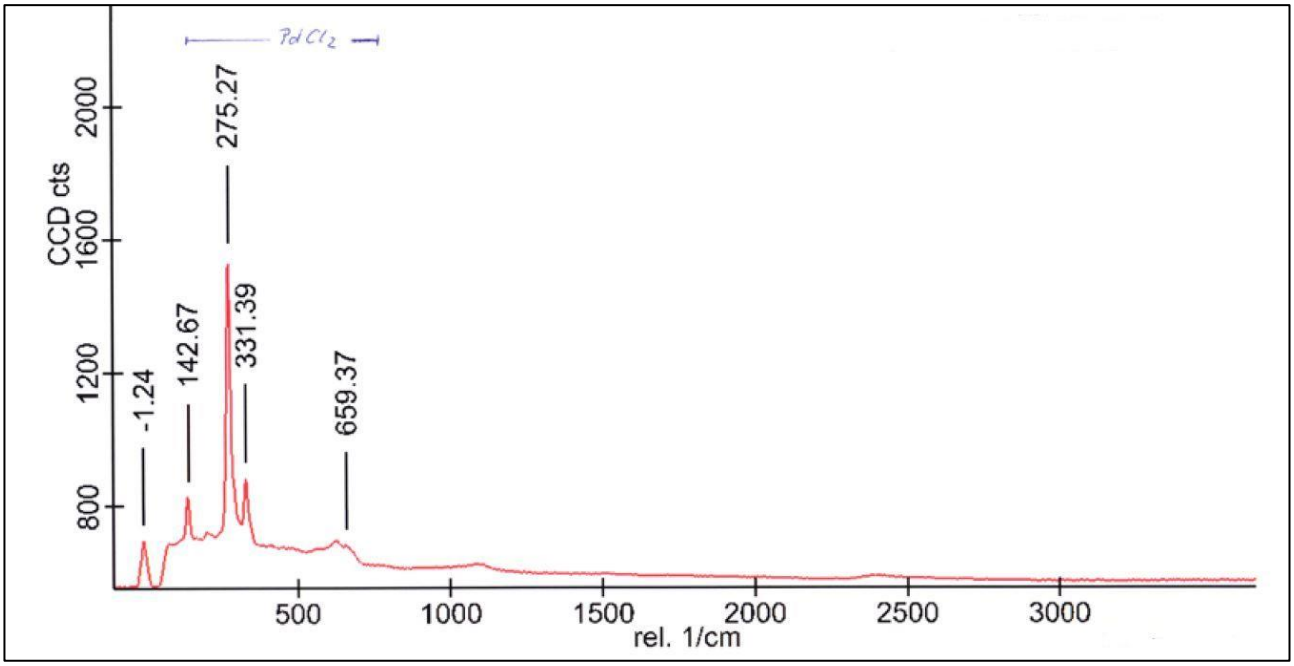


Figure 1. Raman spectrum of Palladium dichloride solution

X-ray diffraction

Apparatus: X-ray diffractometer Bruker AXS, D8 Advance, Cu tube

Sample preparations: The test item is homogenized in a mortar, put into the sample holder with a glasinlay, smoothed with a glass plate. Due to the small amount of palladium dichloride the sample was glued into the holder with Oppanol.

Test parameters: 2-80° (2θ), 0.02° step size, 1.2 s step time

Primary side: divergence slit: 0.1° with ASS

Secondary side: Lynx-Eye detector with 3° slit

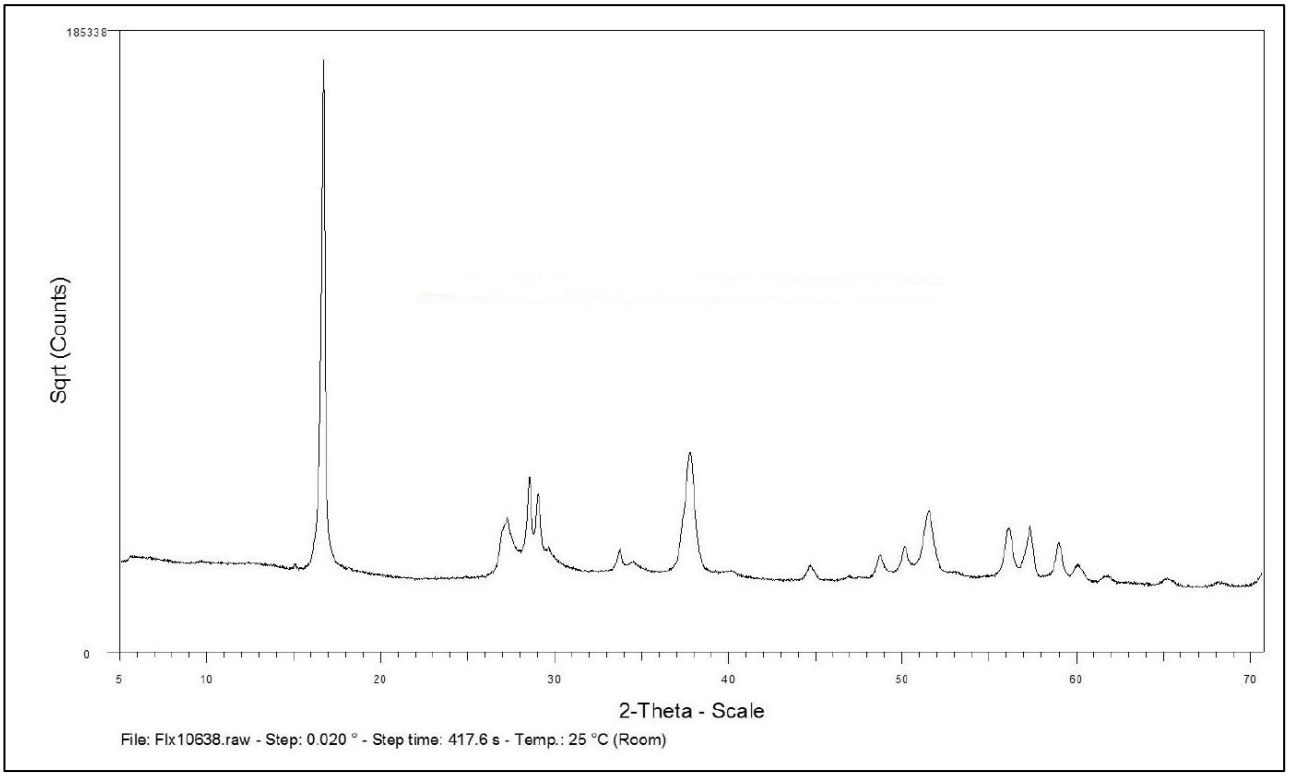


Figure 2. XRD spectrum of Palladium dichloride solid