ID Card
Rhenium

Version 10 October 2024

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	Rhenium
EC number	231-124-5
CAS number	7440-15-5
Description	Not available
Composition type	Mono-constituent substance

2. Synonyms and other identifiers of the substance

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

Molecular formula	Re
Structural formula	Not applicable
Smiles notation	[Re]
Optical activity	Not applicable
Typical ratio of (stereo) isomers	Not applicable
Molecular Weight / Molecular Weight range	186,21 g/mol

5. Typical composition of the substance

Table 3. Typical composition

	Name	Symbol / Formula	Typical concentration (%)	Concentration range (%)
Main constituent(s)*	Rhenium	Re	≥ 99,9	99,9 - 100
Other impurities##	Other	B, Hf, Nb, Ta, V, Co, Cr, Mg	≤ 0,1	0 – 0,1

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

** ≥ 1 % (or lower if contributing to the hazard). An additive is a substance that has been intentionally added to stabilise the substance and which cannot be removed without changing the chemical nature to which it is added.

≥ 1 %. 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.

< 1 % and potentially influencing the classification of the substance.

The composition given above is typical and should therefore represent the majority of Rhenium as manufactured and/or imported in the EEA market. Rhenium containing less than 99,9 % Re may still be considered to be the same for the purpose of registration under REACH and may be referred to as impure Rhenium to distinguish if from the typically pure Rhenium.

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

Table 4. Appearance / physical state / properties of the solid substance

Physical state	Solid
Physical form*	Crystalline
Appearance	Metal grey powder or pellets
Particle size**	Fine powder / coarse powder / massive object
Does the substance contain 'bound water'?#	No
Does the substance contain 'crystallisation water'?#	No
Does the solid hydrolyse?##	No
Is the solid hygroscopic?§	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.

'Bound water': water molecules that are coordinated as bound ligands. 'Crystallisation water' or hydration water: water that occurs in crystals (necessary for the maintenance of crystalline properties) but which is not directly bound to the metal ion (a hydrate contains a definite % of crystallisation water e.g. $CuSO_4 \times 5 H_2O$, an anhydride does not contain any water)

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 3.

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 5. 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)	X		

Molecular analysis			
Infrared (IR) spectroscopy			X
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			
Specific oxygen analyser by combustion and CO2 Infrared titration (powder and solid)		X	
Specific nitrogen analyser by fusion and N2 titration (powder and solid)		X	
Specific carbon analyser by combustion and CO2 Infrared titration (powder and solid)		X	
Specific sulfur analyser by combustion and SO2 Infrared titration (powder and solid)		X	

* 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.

EPMF Recommendation:

Based on guidance and knowledge available to EPMF and its consultants by July 2012, below recommended characterisation should be performed by each legal entity for each type of nano Rhenium (in addition to any method performed to confirm the identity and composition of the material) in order to satisfy the requirements/expectations of ECHA and other authorities:

- Select and prepare adequate sample: cf. OECD's "Preliminary Guidance Notes on Sample Preparation and Dosimetry for the Safety Testing of Manufactured Nanomaterials" (2010) available online: http://www.oecd.org/officialdocuments/displaydocument/?cote=env/jm/mono(2010)25&doclanguage=en and ISO 14887:2000;
- Determine particle size: DLS / laser diffraction + number based distribution (can theoretically be calculated from the volume based distribution);
- Determine surface area: BET for dry powders. For suspensions, estimate surface area on the basis of particle size distribution (if shape of nano Rhenium particles is more or less spherical);
- Report detailed morphology: Digital light microscopic images AND either TEM or REM to qualitatively describe the shape and the agglomeration behaviour of the particles.

The results of this characterisation work will need to be attached to the individual IUCLID 5 files.

8. Lead Registrant

KGHM Metraco (Poland) volunteers to be the Lead Registrant for Rhenium. 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.