



# ID Card

## Slimes and Sludges, precious metal refining

Version 4 July 2023

Please note that discussions on the ID Cards are currently ongoing.  
Should you need further information / detail, please contact [info@epmf.be](mailto:info@epmf.be)  
The content of this ID Card may be adjusted as the Refinables Project develops.

### Notes:

- *This ID card is used to support the substance sameness discussions in SIEFs and to describe the substance/group 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

The proper identification and characterisation of a substance or intermediate is the responsibility of each registering legal entity.

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 group

**Table 1. Identification of the group**

	Proposed by EPMF Refiners Work Group	Original (in EC inventory)
<b>Name</b>	Slimes and Sludges, precious metal refining	Slimes and Sludges, precious metal refining
<b>EC number</b>	308-516-0	308-516-0
<b>CAS number</b>	98072-61-8	98072-61-8
<b>Description</b>	Dry or wet residues resulting from hydro-metallurgical and/or electrolysis processes used in the refining of precious metals.  Slimes and sludges from precious metals refining generally contain precious and base metals, and insoluble inorganic compounds in varying concentrations.	None

**N.B.:** The description proposed above will be further detailed by EPMF for Registration purposes.

## 2. Synonyms and other identifiers of the group

- Slime, Cu/Ni free
- Slime, roasted Se-free
- Ag anode slime
- Slimes, Ag electrolysis
- Slimes, Au electrolysis
- Slimes, PGM refining

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

Although slimes and sludges resulting from other metals refining processes may be very similar to precious metals slimes and sludges, they are not listed here as they are covered by other consortia and must hence, not be registered using the same information or in the same Registration Dossier.

**Table 2. Synonyms and similar/same substances belonging to the group**

Name	EC number	CAS number	Description (EC inventory)
Residues, silver sludge-electrolysis zinc-pptd., precious metal-contg.	309-641-3	100656-52-8	The residue obtained by zinc precipitation of the material obtained during the recovery of palladium and platinum from the anode sludges of silver electrolysis. Composed primarily of palladium, platinum, rhenium and the oxides of iron and zinc.
Slimes and Sludges, copper pickling wastewater treatment	293-678-4	91081-71-9	Sludges formed by the precipitation of compounds of non-ferrous metals arising from the neutralizing during effluent treatment of wash waters and spent pickling acids used for the cleaning and removal of oxide from copper and copper alloys.
Leach residues, precious metal smelting scrap	309-770-5	100995-79-7	The residues obtained from the leaching of scrap and waste materials containing gold, iridium, osmium, palladium, platinum, rhenium, ruthenium or silver. Composed primarily of alumina and silica with traces of all of the precious metals.

**N.B.:** No registration dossier will be prepared by the EPMF for the materials listed in the above table. EPMF Members are recommended to register their material using the identifiers provided in Table 1, for which a dossier will be prepared by the EPMF.

## 4. Usual composition of the substance

**Table 3. Usual composition**

Type	Name of the element	Symbol	Species present	Typical concentration (%)	Concentration range (%)
Precious metals	Silver	Ag	Metallic, oxides, sulphates, sulphides, chlorides	16	0,1 - 84
	Gold	Au	Metallic, oxides, sulphides, chlorides	11	0 - 95
	Iridium	Ir	Metallic, oxides, sulphides, chlorides, chloro-complexes	1,1	0 - 13
	Palladium	Pd	Metallic, oxides, sulphides, chlorides, chloro-complexes	8	0 - 88
	Platinum	Pt	Metallic, oxides, sulphides, chlorides, chloro-complexes	5,3	0 - 60
	Rhodium	Rh	Metallic, oxides, hydroxides, sulphides, chlorides, chloro-complexes, nitro-complexes	2,6	0 - 21
	Ruthenium	Ru	Metallic, oxides, hydroxides, sulphides, chlorides, chloro-complexes	3,2	0 - 29
Other metals/ constituents	Aluminium	Al	Oxides	0,96	0 - 14
	Arsenic	As	Metallic, oxides, hydroxides, chlorides, sulphides	0,93	0 - 5,2
	Boron	B	Oxides	0,002	0 – 0,01
	Barium	Ba	Oxides, hydroxides, chlorides, sulphates	0,96	0 - 16
	Bismuth	Bi	Metallic, oxides, hydroxides, chlorides, sulphides	1,1	0 - 9,2
	Carbon	C		0,48	0 - 8
	Calcium	Ca	Oxides, hydroxides, chlorides, sulphates	0,66	0 - 10
	Cadmium	Cd	Chlorides, oxides	0,02	0 - 0,2
	Cerium	Ce	Chlorides, oxides	0,05	0 - 1
	Chlorine	Cl	Chlorides, chloro-complexes	10	0 - 60
	Cobalt	Co	Oxides, hydroxides, chlorides	0,18	0 - 3,7
	Chromium	Cr	Metallic, oxide (Cr <sub>2</sub> O <sub>3</sub> ), hydroxide, chloride	1,2	0 - 20
	Copper	Cu	Metallic, oxides, hydroxides, chlorides, sulphides	5,7	0 - 33
	Iron	Fe	Metallic, oxides, chlorides, sulphides, sulphates	4,3	0 - 40
	Potassium	K	Chlorides, oxides	0,67	0 - 17
	Magnesium	Mg	Chlorides, oxides	0,13	0 - 3
	Manganese	Mn	Chlorides, oxides	0,03	0 - 0,5
	Sodium	Na	Chlorides, oxides	1,1	0 - 15

	Nickel	Ni	Metallic, oxides, hydroxides, sulphides, chlorides	1	0 - 10
	Lead	Pb	Metallic, oxides, hydroxides, sulphates, chlorides	2,3	0 - 14
	Sulphur	S	Sulphates, sulphides	1,5	0 - 26
	Antimony	Sb	Metallic, oxides, hydroxides, chlorides	0,65	0 - 8
	Selenium	Se	Metallic, oxides	4	0 - 30
	Silicon	Si	Oxides	1,5	0 - 13
	Tin	Sn	Metallic, oxides, hydroxides, chlorides	0,56	0 - 5
	Tellurium	Te	Metallic, oxides, hydroxides, telluric acid, sulphides	2,3	0 - 25
	Titanium	Ti	Oxide	0,17	0 - 4
	Zinc	Zn	Oxides, chlorides, sulphides	0,33	0 - 4,5
	Zirconium	Zr	Oxide	0,28	0 - 5
<b>Total</b>				90	

#### N.B.1: Classification drivers are indicated in red

Metal species were determined based on information available to registrants and/or mineralogical analysis (by means of XRD analysis).

The composition given above represents the usual elemental/compound content available to the Members of the EPMF by 28 February 2014. This usual content represents the majority of the Slimes and Sludges, precious metal refining that is placed on the EEA market.

In a UVCB substance, the number of constituents is relatively large and/or; the composition is, to a significant part, unknown and/or; the variability of composition is relatively large or poorly predictable. Hence, concentration ranges outside the ones given above do not exclude sameness and are usually referred to as unusual or exceptional situations. Each potential registrant is responsible for performing its own elemental analysis.

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

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

<b>Physical state</b>	Solid
<b>Appearance</b>	Grey-black
<b>Particle size*</b>	Powder

\* 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.

## 6. 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.

In addition to analytical data, all registrants should use expert judgment and process knowledge to characterize their substance.

**Table 5. 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			
Raman spectroscopy			
<b>Mineralogical analysis</b>			
X-Ray Fluorescence (XRF)			
X-Ray Diffraction (XRD)	X		
<b>Morphology and particle sizing</b>			
Optical microscopy and electron microscopy (SEM, TEM, REM)* #	X		
Laser diffraction* #			
Particle size by other means (e.g. sieve analysis)#			
Surface area by N-BET* #			
<b>Other</b>			
Magnetite analyser		X	
S/C analyzer		X	
Separation technique: ion exchange chromatography		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.

## 7. Lead Registrant

Aurubis AG (Germany) volunteers to be the Lead Registrant for this intermediate. The European Precious Metals Federation (EPMF) will provide support to the Lead Registrant as laid down in the EPMF Agreement.

## 8. Scope of the Registration Dossier

The uses included in this Registration Dossier are summarised in the table below and accompanied with the appropriate text.

**Table 6. Reported uses of the substance**

Description of use	Sector of Use (SU)	Process Category (PROC)	Environmental Release Category (ERC)
Manufacture of an intermediate	NA	<ul style="list-style-type: none"> <li>PROC 1: Use in closed process, no likelihood of exposure</li> <li>PROC 2: Use in closed, continuous process with occasional controlled exposure</li> <li>PROC 3: Use in closed batch process (synthesis or formulation)</li> <li>PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises</li> <li>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</li> <li>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</li> <li>PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li> <li>PROC 15: Use as laboratory reagent</li> <li>PROC 21: Low energy manipulation of substances bound in materials and/or articles</li> <li>PROC 22: Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting</li> <li>PROC 23: Open processing and transfer operations with minerals/metals at elevated temperature</li> <li>PROC 24: High (mechanical) energy work-up of substances bound in materials and/or articles</li> <li>PROC 26: Handling of solid inorganic substances at ambient temperature</li> <li>PROC 27b: Production of metal powders (wet processes)</li> </ul>	<ul style="list-style-type: none"> <li>ERC 1: Manufacture of substances</li> </ul>



Use as an intermediate in metal manufacturing	<ul style="list-style-type: none"><li>• SU 14: Manufacture of basic metals, including alloys</li></ul>	<ul style="list-style-type: none"><li>• PROC 1: Use in closed process, no likelihood of exposure</li><li>• PROC 2: Use in closed, continuous process with occasional controlled exposure</li><li>• PROC 3: Use in closed batch process (synthesis or formulation)</li><li>• PROC 4: Use in batch and other process (synthesis) where opportunity for exposure arises</li><li>• PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</li><li>• PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</li><li>• PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</li><li>• PROC 15: Use as laboratory reagent</li><li>• PROC 21: Low energy manipulation of substances bound in materials and/or articles</li><li>• PROC 22: Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting</li><li>• PROC 23: Open processing and transfer operations with minerals/metals at elevated temperature</li><li>• PROC 24: High (mechanical) energy work-up of substances bound in materials and/or articles</li><li>• PROC 26: Handling of solid inorganic substances at ambient temperature</li><li>• PROC 27b: Production of metal powders (wet processes)</li></ul>	<ul style="list-style-type: none"><li>• ERC 6a: Industrial use resulting in manufacture of another substance (use of intermediates)</li></ul>
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