ID Card
Materials for reclaim, precious metals with or without support

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Notes:

- *This ID card is used to support the substance sameness discussions and to describe the substance/group to the best of the members' knowledge.*
- *It also aims at grouping communications relevant to the request of available data or information 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

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').

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1. Identification of the group

Table 1. Identification of the group

	Original (in EC inventory)
Name	Waste solids, precious metal refining
Public name	Material for reclaim, precious metals with or without support
EC number	308-526-5
CAS number	98072-70-9
Description	None
*** EPMF Description**	Primary and secondary sources of precious metals in metallic, oxide, chloride and other forms in varying concentrations, resulting from the application of thermal or thermo-chemical processes or end-of-life criteria whose supports may, where present, include varying amounts of: □ Ceramics (such as silica, alumina and zeolites), □ Carbon or organics (such as carbon, paper, or plastics), and/or Metallics (such as stainless steel or other transition metal alloys).
Composition type	UVCB

***** The description has been further detailed by EPMF in the registration dossier IUCLID Reference substance record (Description field) and in the CSR.

2. Synonyms and other identifiers of the group

- Spent (auto-)catalysts;
- Materials arising from industrial, electronic, dentistry, jewellery, and other applications;
- Photographic film;
- Spent fuel cells, etc.

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

None

4. Boundary composition of the substance

Table 2. Typical composition

Element	Typical concentration (%)	Minimum concentration (%)	Maximum concentration (%)	Species
Silver	3.34	0.00	25.00	Metallic or oxidic
Gold	0.61	0.00	3.00	Metallic or oxidic
Iridium	0.51	0.00	5.00	Metallic or oxidic
Palladium	4.47	0.00	14.00	Metallic or oxidic
Platinum	3.79	0.00	25.00	Metallic or oxidic
Rhodium	1.23	0.00	5.00	Metallic or oxidic
Ruthenium	0.96	0.00	10.00	Metallic or oxidic
Aluminium	13.82	0.00	50.00	oxide, aluminate
Antimony	0.51	0.00	2.00	
Arsenic	0.15	0.00	0.75	
Cadmium	0.00	0.00	0.80	
Calcium	3.45	0.00	30.00	
Carbon	12.40	0.00	30.00	
Cerium	1.25	0.00	5.00	
Chlorine	0.15	0.00	10.00	
Chromium	0.23	0.00	15.00	
Cobalt	0.81	0.00	3.70	
Copper	4.29	0.01	30.00	oxide
Iron	3.24	0.00	35.00	oxide
Lead	0.77	0.10	10.00	
Magnesium	1.95	0.00	10.00	assumed chloride
Nickel	0.61	0.05	30.00	
oxygen	30.59	19.50	38.00	
Silicon	7.05	0.00	50.00	silicate

Sodium	0.87	0.00	20.00	assumed chloride
Sulfur	0.45	0.00	5.00	
Tellurium	1.28	0.00	2.60	
Tin	0.68	0.00	10.00	
Titanium	1.03	0.00	20.00	metallic
Zinc	0.48	0.00	1.61	oxide
Minor constituents	< 1	0.00	6.50	refers to Total % of minor elements (e.g. Ba, Bi, Hf, K, Mo, Mn, P, Ta, W, Zr), each not affecting the hazard profile
Elemental composition total: 102.2%				
Species	**Typical concentration (%)**	**Minimum concentration (%)**	**Maximum concentration (%)**	
precious metals (PM) – metallic or oxidic	16.70	0.23	51.40	
non PM oxides (Al, Si, Fe, Cu, ...)	55.00	1.20	94.00	bound into aluminate/silicate/ceramic phase
Mineralogical composition total: 71.7%				

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

The composition given above represents the usual elemental/compound content available to the Members of the EPMF by July 2023. This usual content represents the majority of the Materials for reclaim, precious metals with or without support 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 composition analysis.

5. Substance identity profile (SIP) of the substance

Substance Name	Substance Information Page				
Materials for reclaim, precious metals with and without supports				**Legend**	Decisive substance sameness criterion
					Indicative substance sameness criterion
Substance description:	Materials resulting from thermal pre-treatment operations of products with end-of-life criteria or secondary sources of precious metals whose supports may, where present, include varying amounts of: □ Ceramics (such as silica, alumina and zeolites), □ Carbon or organics (such as carbon, paper, or plastics), and/or □ Metallics (such as stainless steel or other transition metal alloys).				No substance sameness criterion
SIEF description:					
Substance Identity	EC/list name:	Waste solids, precious metal refining		SMILES:	not applicable
	IUPAC name:			InChI:	not applicable
	Other names			Type of substance:	UVCB
	EC/List no.:	308-526-5		origin:	Inorganic
	CAS no.:	98072-70-9			
	Molecular formula:	not applicable		Substance listed	
SID parameters		**Sameness criteria**			**Indication of variability** (fixed, low or high variation)
Sources (input materials)	Precious metal containing waste respectively end-of-life-cycle products, such as spent catalysts, photographic film, sweeps, materials arising from industrial, electronic, dentistry, jewelry and other applications, etc. These materials may have supports that includes various amounts of ceramics, carbon, or organics.				high variability
Process	Thermal treatment. To remove moistness and/or volatile organic components, the treatment takes place under normal or inert gas atmosphere. Alternatively, thermal treatment can also include the use of a reducing/oxidizing gas or a molten flux. This kind of thermal treatment serves to modify components in such a way that they can be separated from the precious metals. After thermal pre-treatment, the materials will be treated mechanically by milling, weighing, homogenization and serve as starting materials for further precious metals refining processes				medium to low variability
Elemental composition	**Core**	**min (% w/w)**	**max (% w/w)**	**Typical (%w/w)**	
	Precious metals (Ag, Au, Ir, Pd, Pt, Rh, Ru)	0.2	40.0	14.9	high variability
	Aluminum	0.0	50.0	13.8	high variability
	Silicon	0.0	50.0	7.1	high variability
	Oxygen	19.5	38.0	30.6	high variability
	Iron	0.0	35.0	3.2	high variability
	Carbon	0.0	30.0	12.4	high variability
	Copper	0.01	30.00	4.29	high variability
	Calcium	0.0	30.0	3.5	high variability
	Sum=			89.8	
Mineralogical composition	Precious metals (Ag, Au, Ir, Pd, Pt, Rh, Ru) metallic or oxidic	0.2	51.4	16.7	
	non PM oxides (Al, Si, Fe, Cu, ...)	1.2	94.0	55.0	high variability
	Sum=			71.7	high variability
Physical characteristics	**physical state (at 20°C, 1013 hPa)**	beige solid powder			
Conclusion	**Materials for reclaim, precious metals with or without supports are thermal processed end of life products, out-of-spec products and production wastes which are sent to precious metal refining to reclaim their precious metal content.**				

The substance identity profile (SIP) outlines the main substance identifier/qualifiers relevant for substance identity. It reports sameness information on physical state (solid, liquid, gas), physical form (massive, powder), source, process descriptions and composition. Parameters are given a color code depicting importance for substance sameness. Dark green for decisive/fixed/low variability identity criteria, light green for indicative parameters that support the substance identity but are less well defined and/or characterized by medium variability, and white for parameters not relevant for substance identity.

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

Table 3. Appearance / physical state / properties of the substance

Physical state	Solid
Appearance	Beige - grey
Particle size*	Fine to coarse powder

* 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.

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.

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

Table 4. 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			
Mineralogical analysis			
X-Ray Fluorescence (XRF)			
X-Ray Diffraction (XRD)	X		
Morphology and particle sizing			
Optical microscopy and electron microscopy (SEM, TEM, REM)* #	X		
Laser diffraction* #	X		
Particle size by other means (e.g. sieve analysis)#			

Surface area by N-BET* #			
Other			
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.

8. Lead Registrant

Heraeus (Germany) is 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.

9.Scope of the Registration Dossier

All UVCB precious metal Refinables have only uses as an intermediate. Moreover, UVCB exposure scenarios are developed on a company / site-specific basis.