# GROUP 4. Slimes and sludges

Version 22 January 2010

(**N.B.:** The content of this ID Card may be adjusted as the Refiners Project develops)

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## 1. Identification of the group

**Table 1.** Identification of the group

| | Proposed by PMC Refiners Work Group | Original (in EC inventory) |
|---|---|---|
| **Name** | Slimes and Sludges, precious metal refining | Slimes and Sludges, precious metal refining |
| **EC number** | 308-516-0 | 308-516-0 |
| **CAS number** | 98072-61-8 | 98072-61-8 |
| **Description** | Dry or wet residues resulting from hydro-metallurgy and electrolysis processes for precious metal refining.<br>Slimes and sludges from precious metals refining generally contain precious and base metals, and insoluble inorganic compounds. | None |

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

## 2. Synonyms (and/or commercial names)

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

## 3. Substances that are similar or can be considered as the same

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 |

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| Name | EC number | CAS number | Description (EC inventory) |
|---|---|---|---|
| | | | 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 PMC for the materials listed in the above table. PMC Members are recommended to register their material using the identifiers provided in Table 1, for which a dossier will be prepared by the PMC.

## 4. Usual composition

**Table 3.** Usual composition

| Type | Name of the element | Symbol | Species present *(one line per species)* | Most recent classification of species | Source of classification | Usual concentration range (%) |
|---|---|---|---|---|---|---|
| **Precious metals** | Silver | Ag | Metallic? Oxidic? Sulphides? Chlorides? For all | None | GHS/CLP | 0-66 |
| | Gold | Au | AuSO4 | None | GHS/CLP | 0-81 |
| | Platinum Group Metals | PGM | Metallic? | None | GHS/CLP | 0-95 |
| **Other metals** | Aluminium | Al | AlO3 | None | GHS/CLP | 0-20 |
| | Antimony | Sb | Sb2O3 | Carc. Cat. 3; R40 | GHS/CLP | 0-10 |
| | *Antimony arsenate* | | SbAsSO4 | Xn; R20/22 - N; R51-53 | GHS/CLP | 0-10 |
| | Arsenic | As | As2O3 | T; R23/25 - N; R50-53 | GHS/CLP | 0-10 |
| | Barium | Ba | BaO, BaSO4 | None | GHS/CLP | 0-40 |
| | Bismuth | Bi | Bi2O3 | None | GHS/CLP | 0-15 |
| | *Bismuth arsenate* | | BiAsO4 | None | GHS/CLP | 0-5 |
| | Cadmium | Cd | | Carc. Cat. 2; R45 - Muta. Cat. 3; R68 - Repr. Cat. 3; R62-63 - T; R48/23/25 - T+; R26 - N; R50-53 | GHS/CLP | 0-10 |
| | Calcium | Ca | CaO | None | GHS/CLP | 0-30 |
| | Chromium | Cr | Cr2O3 | None | GHS/CLP | 0-20 |
| | Cobalt | Co | Species? | R42/43 - R53 | GHS/CLP | 0-20 |
| | Copper | Cu | Cu2O | Xn; R22; N; R50-53 | GHS/CLP | 0-45 |

| Type | Name of the | Symbol | Species present | Most recent | Source of | Usual |
|---|---|---|---|---|---|---|
| | *Copper sulphate* | | Cu2SO4 | Xn; R22 - Xi; R36/38 - N; R50-53 | GHS/CLP | 0-23 |
| | Lead | Pb | PbSO4 | Repr. Cat. 1; R61 - Repr. Cat. 3; R62 - Xn; R20/22 - R33 - N; R50-53 | GHS/CLP | 0-35 |
| | Iron | Fe | FeO | None | GHS/CLP | 0-45 |
| | Nickel | Ni | NiSO4 | Carc. Cat. 1; R49 - Muta. Cat. 3; R68 - Repr. Cat. 2; R61 - T; R48/23 - Xn; R20/22 - Xi; R38 - R42/43 - N; R50-53 | GHS/CLP | 0-20 |
| | Selenium | Se | Ag2Se (Cu2Se), SeO | T; R23/25 - R33 - N; R50-53 | GHS/CLP | 0-35 |
| | Silicon | Si | SiO2 | None | GHS/CLP | 0-5 |
| | Sodium | Na | Na2O | None | GHS/CLP | 0-10 |
| | Tellurium | Te | Cu2Te (Cu2Se), TeO2 | None | GHS/CLP | 0-35 |
| | Tin | Sn | SnSO4, SnO2 | None | GHS/CLP | 0-10 |
| | Zinc | Zn | Metallic? | F; R15-17 - N; R50-53 | GHS/CLP | 0-10 |
| **Other constituents** | Ammonium | NH3/NH4+ | | R10 ⊗ - T; R23 - C; R34 - N; R50 | GHS/CLP | 0-15 |
| | Carbon | C | C, Carbonate (filter) | | | 0-30 |
| | Chlorine | HCl or Cl- | | T; R23 - Xi; R36/37/38 - N; R50 | GHS/CLP | 0-25 |
| | *Calcium chloride* | | CaCl2 | Xi; R36 | GHS/CLP | 0-15 |
| | *Magnesium chloride* | | MgCl2 | None | GHS/CLP | 0-3 |
| | Nitrogen | N | NO3--, nitric acid | O; R8 - C; R35 | GHS/CLP | 0-50 |

The composition given above represents the usual elemental content available to the Members of the Consortium by 7 of December 2009. This usual content represents the majority of the Precious Metals Refining Slimes and Sludges that are placed on the EEA market.

Concentration ranges outside the ones given above do not exclude sameness and are usually referred to as unusual or exceptional situations. For instance, concentrations higher than 80% of gold, 60% of copper, 70 % of nickel, 60% of selenium, 25% of silicon, and 65% of chlorine have been declared by some Members of the Consortium. Each potential registrant is responsible for performing its own elemental analysis (PMC will specify preferred method in due course).

## 5. Classification (*additive - based on composition provided in table 2 above*)

To be completed

## 6. Basic physico-chemical characteristics and properties

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**Table 4.** List of physico-chemical characteristics of the substance to facilitate sameness confirmation

| Characteristic | Description/value | Comment |
|---|---|---|
| **Physical state** (solid, liquid, gaseous) | | |
| **Physical form** (Aerosol, Compact, Crystalline, Dispersion, Fibre, Filaments, Flakes, Liquified gas, Particulates, Paste, Pellets, Powder, Suspension, Viscous, Refrigerated Liquid, Other) | | |
| **Usual particle size range(s)** (D10, D50, D90 in nm, µm or mm) | | |
| **Colour** | | |
| **Odour** (Ammonia-like, Biting, Characteristic of sulfur-containing compounds, Characteristic of aromatic compounds, Faint, Garlic-like, Pungent, Slight, Sweetish, Odourless, Other) | | |
| **Substance type** (Element, Inorganic, Natural substance, Organic, Organo-metallic, Petroleum Product) | | |
| **Water solubility** | | |
| **Relative density** ($g/cm^3$) **or specific gravity** | | |
| **Specific surface area** ($m^2/g$) | | |

## 7. Lead Registrant

Aurubis volunteers to be the Lead Registrant for this intermediate.

## 8. REACH Strategy

**Table 5.** REACH strategy for the group (basis for REACH Registration preparation)

| Subject | Description | Comment |
|---|---|---|
| **SIEF** | As pre-registered | May require splitting in several SIEF and separate dossiers if differences are identified. |
| **REACH category** | UVCB | |
| **Intermediate status** | Transported | At least one Member of the PMC has declared this material as transported > 1000 t/a. This will be considered as the reference to produce the Dossier as other forms (on-site and/or below 1000 t/a are covered by the requirements of transported > 1000 t/a). |
| **Tonnage band** | > 1000 | |
| **Information requirements** | Available + Annex VII | |
| **(Likely) Classification** | Carc. Cat. 1, Mut. Cat. 3, Repr. Cat. 2 and R50-53 | Depends on confirmation of composition/species. |

| Subject | Description | Comment |
|---|---|---|
| **Resulting registration deadline** | 2010 | |
| **Other** | | |

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