ID Card Flue dust, precious metal refining

Version 4 July 2023

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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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

| | Original (in EC inventory) |
|--------------------|--|
| Name | Flue dust, precious metal refining |
| EC number | 308-496-3 |
| CAS number | 98072-44-7 |
| Description | The dust obtained from the refining of materials from primary and secondary sources containing gold, iridium, osmium, palladium, platinum, rhenium, ruthenium and silver. Composed primarily of lead with traces of other metals. |
| * EPMF Description | Product resulting from the smelting, refining and/or use of precious metals and its alloys obtained from primary and secondary sources and including recycled plant intermediates. Recovered from exhaust air by filtration via cloth bags, arising from hygiene extraction systems on processes in the precious metals recovery flowsheet. Flue dust, precious metal refining mainly contain metal oxides, hydroxides, |
| | sulphides and chlorides in varying concentrations, with small quantities of precious metals. |
| 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

None

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

Although flue dusts resulting from other metals refining processes may be very similar to precious metals flue dust, 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. Substances also falling under this group

| Name | EC number | CAS number | Description (EC inventory) | |
|--------------------------------|-----------|------------|---|--|
| Flue dust, silver- refining | 308-276-7 | 97926-57-3 | Product resulting from the smelting, refining and/or use of silver and its alloys obtained from primary and secondary sources and including recycled plant intermediates. Consists primarily of oxides and halide compounds of silver and lead and may contain other residual non-ferrous metals and their compounds. | |

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. Boundary composition of the substance

Table 3. Typical composition

| Element | Typical concentration (%) | Minimum concentration (%) | Maximum concentration (%) | Species |
|-----------|---------------------------|---------------------------|---------------------------|------------------------------|
| Silver | 7.16 | 0.00 | 20.81 | compound e.g selenide, oxide |
| Gold | 0.36 | 0.00 | 1.20 | |
| Iridium | 0.17 | 0.00 | 0.50 | |
| Palladium | 0.45 | 0.00 | 2.00 | |
| Platinum | 0.26 | 0.00 | 1.00 | |
| Rhodium | 0.08 | 0.00 | 0.30 | |
| Ruthenium | 0.09 | 0.00 | 0.20 | |
| Aluminium | 2.85 | 0.00 | 18.00 | oxide |
| Antimony | 2.45 | 0.00 | 8.00 | oxide |
| Arsenic | 1.23 | 0.00 | 3.10 | |
| Barium | 1.67 | 0.00 | 5.80 | mainly sulfate, oxide |
| Bismuth | 1.34 | 0.00 | 3.00 | oxide |
| Boron | 0.17 | 0.00 | 1.51 | |
| Cadmium | 0.22 | 0.00 | 0.79 | |
| Calcium | 2.75 | 0.06 | 20.00 | oxide |
| Cerium | 2.95 | 0.00 | 4.50 | oxide |
| Chlorine | 2.33 | 0.00 | 8.00 | |



| Chromium | 0.12 | 0.00 | 0.30 | |
|------------|-------|------|-------|-----------------------|
| Copper | 1.48 | 0.00 | 5.50 | mainly sulfate, oxide |
| Iron | 1.71 | 0.00 | 6.00 | |
| Lead | 16.37 | 1.50 | 46.26 | mainly sulfate, oxide |
| Magnesium | 0.87 | 0.00 | 6.00 | oxide |
| Manganese | 0.10 | 0.00 | 0.30 | |
| Nickel | 0.80 | 0.00 | 2.30 | oxide |
| Oxygen | 15.52 | 7.00 | 30.00 | |
| Phosphorus | 0.75 | 0.00 | 1.75 | |
| Potassium | 1.15 | 0.00 | 1.95 | |
| Selenium | 9.84 | 0.00 | 43.00 | |
| Silicon | 4.99 | 0.25 | 16.50 | |
| Sodium | 1.33 | 0.00 | 5.00 | |
| Strontium | 0.84 | 0.00 | 3.20 | |
| Sulfur | 4.34 | 1.30 | 12.30 | |
| Tellurium | 2.83 | 0.00 | 8.50 | |
| Tin | 1.18 | 0.00 | 2.60 | oxide |
| Titanium | 0.17 | 0.00 | 0.50 | |
| Zinc | 3.25 | 0.00 | 12.00 | oxide |
| Zirconium | 1.94 | 0.00 | 4.50 | oxide |

Elemental composition total: 96.1%

| Species | Typical concentration (%) | Minimum concentration (%) | Maximum concentration (%) | | |
|---|---------------------------|---------------------------|---------------------------|--|--|
| sulphates/sulphides | | 35.00 | 3.90 | depending on sources (sulfidic or | |
| oxides | | 25.00 | 2.20 | not) more/less sulfates vs oxides will be present, or other metal species like hydroxides, chlorides can also occur | |
| Mineralogical composition total: 60.09/ | | | | | |

Mineralogical composition total: 60.0%

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 Flue dust, 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 composition analysis.

5. Substance identity profile (SIP) of the substance

| ubstance Name | Substance Information Page | | | | | |
|------------------------------------|--|--|---|--|---|--|
| lue dust, precious metal re | efining | | | Legen | d Decisive substance samenes | |
| | • | | | | criterion | |
| | | | | | Indicative substance samen | |
| | | | | | criterion | |
| Antonio descriptioni | Deadure and dates from the analytics and | | | | | |
| ibstance description: | | - | | | No substance sameness | |
| | secondary sources and including recycles bags, arising from hygiene extraction sys | | | | onterion | |
| | Flue dust, precious metal refining mainly | | | | | |
| | concentrations, with small quantities of | | and sulpridesysulpriates i | in Ambing | | |
| | concern accord, with arter spanning or | precious metals. | | | | |
| | | | | | | |
| ee doordoor | | | | | | |
| EF description: | | | | | | |
| bstance Identity | EC/list name: | Flue dust, predious | | SMILES: | not applica | |
| , | | metal refining | | | | |
| | IUPAC name: | | | InChi: | not applica | |
| | Other names | | | Type of substance: | U\ | |
| | EC/List no.: | 308-496-3 | 1 | origin: | Inorga | |
| | CAS no.: | 98072-44-7 | 1 | | July | |
| | Molecular formula: | not applicable | 1 | Substance listed | | |
| | | | | | | |
| | | | | | | |
| D parameters | | Sameness criteria | | | Indication of variability | |
| | | | | | (fixed, low or high variation | |
| | | | | | high variability | |
| ources (input materials) | Precious metal containing primary and s | econdary sources and r | recycled plant intermedia | ites. | riight variability | |
| ources (input materials) | Precious metal containing primary and s | econdary sources and r | recycled plant intermedia | ites. | right variability | |
| | | | | | | |
| | Dust generated during several processe: | s in production, process | sing, and refining of predi | ous metal containing | medium variability | |
| ources (input materials) rocess | Dust generated during several processes materials, and collected in appropriate f | s in production, process facilities. These process | sing, and refining of predicts can include milling, th | ous metal containing ermal treatment, | medium variability | |
| | Dust generated during several processe: | s in production, process facilities. These process Commonly, dusts from | sing, and refining of preci es can include milling, th several processes are co | ous metal containing ermal treatment, flected through a single | medium variability | |
| | Dust generated during several processes materials, and collected in appropriate f melting, smelting, grinding or polishing, exhaust gas filtering system at a site. Th | s in production, process fadilities. These process Commonly, dusts from his mixture of filter dust | sing, and refining of predicts can include milling, the several processes are costs is then sent to refining | ous metal containing ermal treatment, elected through a single to reclaim the precious | medium variability | |
| | Dust generated during several processe materials, and collected in appropriate f melting, smelting, grinding or polishing. | s in production, process fadilities. These process Commonly, dusts from his mixture of filter dust | sing, and refining of predicts can include milling, the several processes are costs is then sent to refining | ous metal containing ermal treatment, elected through a single to reclaim the precious | medium variability | |
| | Dust generated during several processes materials, and collected in appropriate f melting, smelting, grinding or polishing, exhaust gas filtering system at a site. Th metals. For techniques used to collect an | s in production, process fadilities. These process Commonly, dusts from his mixture of filter dust | sing, and refining of predicts can include milling, the several processes are costs is then sent to refining | ous metal containing ermal treatment, elected through a single to reclaim the precious | medium variability | |
| ocess | Dust generated during several processes materials, and collected in appropriate f melting, smelting, grinding or polishing, exhaust gas filtering system at a site. Th metals. For techniques used to collect ar Section 2.4.3 and 2.9.2. | s in production, process facilities. These process Commonly, dusts from its mixture of filter dust and trap dust, fumes and | sing, and refining of preci- ies can include milling, th several processes are co is is then sent to refining if gases -See IPPC NFM BR | ous metal containing ermal treatment, flected through a single to reclaim the precious EEF notes , chapter 2, | medium variability | |
| ocess | Dust generated during several processes materials, and collected in appropriate of melting, smelting, grinding or polishing, exhaust gas filtering system at a site. The metals. For techniques used to collect and Section 2.4.3 and 2.9.2. | s in production, process facilities. These process Commonly, dusts from his mixture of filter dust and trap dust, fumes and min (% w/w) | sing, and refining of precises can include milling, the several processes are costs is then sent to refining it gases -See IPPC NFM BR | ous metal containing ermal treatment, flected through a single to reclaim the precious EEF notes , chapter 2, Typical (%w/w) | medium variability | |
| ocess | Dust generated during several processes materials, and collected in appropriate if melting, smelting, grinding or polishing, exhaust gas filtering system at a site. The metals. For techniques used to collect an Section 2.4.3 and 2.9.2. Core Predous metals | s in production, process facilities. These process Commonly, dusts from his mixture of filter dust and trap dust, fumes and min (% w/w) 0.5 | sing, and refining of precioes can include milling, the several processes are colds is then sent to refining it gases (See IPPC NFM BR max (% w/w) 25.0 | ous metal containing ermal treatment, flected through a single to reclaim the precious EF notes , chapter 2, Typical (16w/w) 8.6 | medium variability | |
| ocess | Dust generated during several processes materials, and collected in appropriate if melting, smelting, grinding or polishing, exhaust gas filtering system at a site. The metals. For techniques used to collect an Section 2.4.3 and 2.9.2. Core Precious metals Copper | s in production, process facilities. These process Commonly, dusts from his mixture of filter dust nd trap dust, fumes and min (% w/w) 0.5 0.0 | sing, and refining of precises can include milling, the several processes are colds is then sent to refining a gases -See IPPC NFM BR max (% w/w) 25.0 | ous metal containing ermal treatment, illected through a single to reclaim the precious EEF notes , chapter 2, Typical (16w/w) 8.6 1.5 | medium variability medium variability low variability | |
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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 4. Appearance / physical state / properties of the substance

| Physical state | Solid |
|----------------|----------------------------------|
| Appearance | Greyish colour of varying shades |
| Particle size* | 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 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) | | | |
| 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)*# | Х | | |
| Laser diffraction*# | X | | |
| Particle size by other means (e.g. sieve analysis)# | | | |
| Surface area by N-BET*# | | | |

| Other | | | | |
|---|--|---|--|--|
| Magnetite analyser | | X | | |
| S/C analyzer | | Х | | |
| Separation technique: ion exchange chromatography | | Х | | |

^{*} Analytical techniques particularly (but not exclusively) relevant for nanomaterials.

8. Lead Registrant

Aurubis (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.

[#]The choice of the technique for particle size depends on the size of the material as manufactured/imported/placed on the market/used.