



# ID Card

## Residues, copper-iron-lead-nickel matte, sulfuric acid-insol.

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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**

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### 1. Identification of the group

**Table 1. Identification of the group**

|                    | Proposed by EPMF Refiners Work Group  | Original (in EC inventory)                                    |
|--------------------|---|---|
| <b>Name</b>        | Residues, copper-iron-lead-nickel matte, sulfuric acid-insol.   | Residues, copper-iron-lead-nickel matte, sulfuric acid-insol. |
| <b>EC number</b>   | 310-050-8   | 310-050-8   |
| <b>CAS number</b>  | 102110-49-6   | 102110-49-6   |
| <b>Description</b> | Dry or wet insoluble residues resulting from successive sulfuric acid-based leaching and/or pyro-metallurgical processes applied on primary and secondary streams resulting from the refining of copper, nickel and other base metals-containing ores and concentrates.<br>Residues from copper-iron-lead-nickel matte leaching mainly contain precious and base metals such as copper, nickel and iron in metallic, sulphate, hydroxide and other mineral forms 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

None



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

None

4. Usual composition of the substance

Table 2. Usual composition

| Type                          | Name of the element | Symbol          | Species present   | Typical concentration (%) | Concentration range (%) |
|-------------------------------|---------------------|-----------------|---|---------------------------|-------------------------|
| Precious metals               | Silver              | Ag              | Metallic  | 6,7                       | 0 - 20                  |
|                               | Gold                | Au              | Metallic  | 0,83                      | 0 - 2,5                 |
|                               | Iridium             | Ir              | Metallic  | 4,2                       | 0 - 10                  |
|                               | Palladium           | Pd              | Metallic  | 12                        | 0 - 25                  |
|                               | Platinum            | Pt              | Metallic  | 12                        | 0 - 25                  |
|                               | Rhodium             | Rh              | Metallic  | 4,7                       | 0 - 10                  |
|                               | Ruthenium           | Ru              | Metallic  | 5                         | 0 - 10                  |
| Other metals/<br>constituents | Aluminium           | Al              | Al <sub>2</sub> O <sub>3</sub> , biotite  | 0,73                      | 0 - 1,2                 |
|                               | Arsenic             | As              | As <sub>2</sub> O <sub>3</sub>  | 2,3                       | 2 - 2,6                 |
|                               | Barium              | Ba              | BaO   | 0,33                      | 0 - 1                   |
|                               | Bismuth             | Bi              |   | 0,33                      | 0 - 1                   |
|                               | Calcium             | Ca              | CaO   | 2,5                       | 0 - 7,5                 |
|                               | Cobalt              | Co              | Metallic  | 0,15                      | 0 - 0,5                 |
|                               | Chromium            | Cr              | Cr <sub>2</sub> O <sub>3</sub> , FeCr <sub>2</sub> O <sub>4</sub>   | 0,39                      | 0 - 1,1                 |
|                               | Copper              | Cu              | Cu <sub>2</sub> O, CuSO <sub>4</sub> ,<br>CuS-Cu <sub>9</sub> S <sub>5</sub> ,<br>CuFeS <sub>2</sub>  | 17                        | 6 - 28                  |
|                               | Iron                | Fe              | Fe <sub>3</sub> O <sub>4</sub> , NiFe <sub>2</sub> O <sub>4</sub> ,<br>Fe <sub>3</sub> S <sub>5</sub> O <sub>21</sub> ,<br>FeCr <sub>2</sub> O <sub>4</sub> , FeS-<br>FeS <sub>2</sub> , FeO(OH),<br>(FeNi) <sub>9</sub> S <sub>8</sub> | 16                        | 7,8 - 22                |
|                               | Potassium           | K               | K <sub>2</sub> O  | 0,12                      | 0 - 0,4                 |
|                               | Magnesium           | Mg              | MgO   | 0,4                       | 0 - 1                   |
|                               | Manganese           | Mn              | MnO   | 0,34                      | 0 - 1                   |
|                               | Sodium              | Na              |   | 0,31                      | 0 - 0,93                |
|                               | Nickel              | Ni              | NiSO <sub>4</sub> , NiFe <sub>2</sub> O <sub>4</sub> ,<br>(FeNi) <sub>9</sub> S <sub>8</sub>  | 3,3                       | 2,6 - 4,5               |
|                               | Lead                | Pb              | PbS   | 1,6                       | 0,4 - 3,5               |
|                               | Sulphur             | S               | Metal<br>sulfides/sulphates   | 9,3                       | 3 - 14                  |
|                               | Antimony            | Sb              | Metallic  | 0,92                      | 0,2 - 1,6               |
|                               | Selenium            | Se              | CuSe  | 3,8                       | 0 - 6                   |
|                               | Silicon             | Si              | SiO <sub>2</sub>  | 3,6                       | 1,2 - 7,5               |
|                               | Tin                 | Sn              | Metallic  | 0,36                      | 0 - 1                   |
| Tellurium                     | Te                  | Metal telluride | 4,2   | 0 - 10                    |                         |
| Zinc                          | Zn                  |                 | 2,5   | 0 - 7,5                   |                         |
| <b>Total</b>                  |                     |                 |   | 116                       |                         |

**N.B.1:** Classification drivers are indicated in red (see also Table 6).

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 9 February 2012. This usual content represents the majority of the Residues, copper-iron-lead-nickel matte, sulfuric acid-insol. 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 3. Appearance / physical state / properties of the substance**

|                       |                   |
|-----------------------|-------------------|
| <b>Physical state</b> | Solid             |
| <b>Appearance</b>     | Dark grey - black |
| <b>Particle size*</b> | Coarse 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 4. 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* #                                      |   |            |                                   |



| 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.

## 7. Lead Registrant

Umicore PMR (Belgium) 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. REACH Strategy

The table below presents the overall Registration Strategy for Residues, copper-iron-lead-nickel matte, sulfuric acid-insol. based on the information available to the EPMF by the date given above on the document.

The Registration Dossier will be prepared for the highest substance status (information requirements associated to a substance or Article 10 Registration being higher than an intermediate handled under strictly controlled conditions or Article 17 or 18 one) and associated tonnage band.

The recap below therefore reflects the scope of work of the EPMF for Residues, copper-iron-lead-nickel matte, sulfuric acid-insol. and sets the minimum and maximum set of information that will be gathered and/or produced when preparing the Registration Dossier for Residues, copper-iron-lead-nickel matte, sulfuric acid-insol. as described in this ID Card.

If higher information requirements are necessary, these can be included in the Registration dossier (if EPMF is made aware of these additional requirements in-time) as an update to the already submitted dossier.

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

| Item                  | Description          | Comment  |
|-----------------------|----------------------|--|
| <b>SIEF</b>           | As pre-registered    |  |
| <b>REACH category</b> | UVCB                 | <p>The composition of leaching residues will depend on the mineral source they originate from and the pre-treatment they have been subject to; the selection of the analytical technique will depend on the nature of the constituent(s) dominating the composition.</p> <p>Part of the composition can remain unknown if the (combination of) analytical technique(s) used to determine the composition is not fully suitable to identify all types of constituents.</p> <p>The variability of the composition of leaching residues both intra- and inter-registrants is not excessively large as they originate from a limited number of mineralogical sources.</p> <p>Leaching residues are truly substances of variable and partially unknown composition.</p> |
| <b>Highest status</b> | Non-SCC intermediate | At least one Member of the EPMF has declared this material as an intermediate not handled under strictly controlled conditions (SCC), meaning an Article 10 dossier is required for joint submission.  |



|                                 |  |  |
|---------------------------------|--|--|
| <b>Intermediate status</b>      |  | Leaching residues are intentionally manufactured to be chemically transformed into another substance. Dedicated hydro-metallurgical processes are designed to leach (precious) metal rich streams to produce (precious) metals via a number of reduction steps and further recover the valuable metal content from the leaching products. These are hence true in-process intermediates in the production of pure precious metals. If they are handled under strictly controlled conditions an Article 17 or 18 dossier is required; if they are not handled under strictly controlled conditions an Article 10 (intermediate) dossier will be required instead. |
| <b>Highest tonnage band</b>     | > 1000 t/a                                       |  |
| <b>Information requirements</b> | Available / Existing + Annex VII – VIII – IX - X |  |
| <b>Existing classification</b>  | See Table 6                                      | Classifications for Residues, copper-iron-lead-nickel matte, sulfuric acid-insol. are proposed in Table 6 as grouped classifications based on composition profile. Compositions or triggers associated to each classification provide a non-exhaustive list of those constituents which can be present in the Refinable.   |
| <b>Registration deadline</b>    | 2010   | Residues, copper-iron-lead-nickel matte, sulfuric acid-insol. was registered as an SCC intermediate in 2010 (Article 17/18 dossier) and will be updated to a full substance registration (Article 10 dossier) in 2014  |

**Table 6. Classification for the group**

|          | <b>Classification CLP</b>   | <b>Composition / classification drivers</b>  |
|----------|---|--|
| <b>1</b> | Carc. 1A, Repro. 1A, Muta 2, STOT Rep 1, ENV Ac 1, ENV Ch 1, Resp/Skin sens. 1, Skin corr. 2, Acute tox oral 3, Eye dam. 1                  | NiSO4 >= 1%; Pb >= 0,3%; Ag >= 0,15%; As2O3 3% – 5%<br><br>$100 / ( (As2O3\%)/5 + (Se\% + Te\%)/100 + (Cu2O\% + CuSO4\% + Pb\% + Sb\% + NiSO4\%)/500 )$ between 50 – 300 mg/kg<br><br>$100 / ( (Se\% + Te\%)/700 + (Pb\% + Sb\% + NiS\% + NiSO4\%)/4500 ) > 5$ mg/L                |
| <b>2</b> | Carc. 1A, Repro. 1A, Muta 2, STOT Rep 1, ENV Ac 1, ENV Ch 1, Resp/Skin sens. 1, Skin corr. 2, Acute tox oral 3, Eye irrit. 2                | NiSO4 >= 1%; Pb >= 0,3%; Ag >= 0,15%; As2O3 1% - 3%<br><br>$100 / ( (As2O3\%)/5 + (Se\% + Te\%)/100 + (Cu2O\% + CuSO4\% + Pb\% + Sb\% + NiSO4\%)/500 )$ between 50 – 300 mg/kg<br><br>$100 / ( (Se\% + Te\%)/700 + (Pb\% + Sb\% + NiS\% + NiSO4\%)/4500 ) > 5$ mg/L                |
| <b>3</b> | Carc. 1A, Repro. 1A, Muta 2, STOT Rep 1, ENV Ac 1, ENV Ch 1, Resp/Skin sens. 1, Skin corr. 2, Eye dam. 1, Acute tox oral 3, Acute tox inh 4 | NiSO4 >= 1%; Pb >= 0,3%; Ag >= 0,15%; As2O3 3% – 5%;<br><br>$100 / ( (As2O3\%)/5 + (Se\% + Te\%)/100 + (Cu2O\% + CuSO4\% + Pb\% + Sb\% + NiSO4\%)/500 )$ between 300 – 2000 mg/kg<br><br>$100 / ( (Se\% + Te\%)/700 + (Pb\% + Sb\% + NiS\% + NiSO4\%)/4500 )$ between 1 and 5 mg/L |

**N.B.1:** STOT driver: NiSO4

**N.B.2:** Classification drivers are (worst-case) assumptions and do not necessarily represent real species/mineralogical composition

**N.B.3:** Classification groups 1-3 have a CMR profile

## 9. 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 7. 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> |



| Description of use                            | Sector of Use (SU)   | Process Category (PROC)  | Environmental Release Category (ERC)  |
|---|--|--|---|
| 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> |