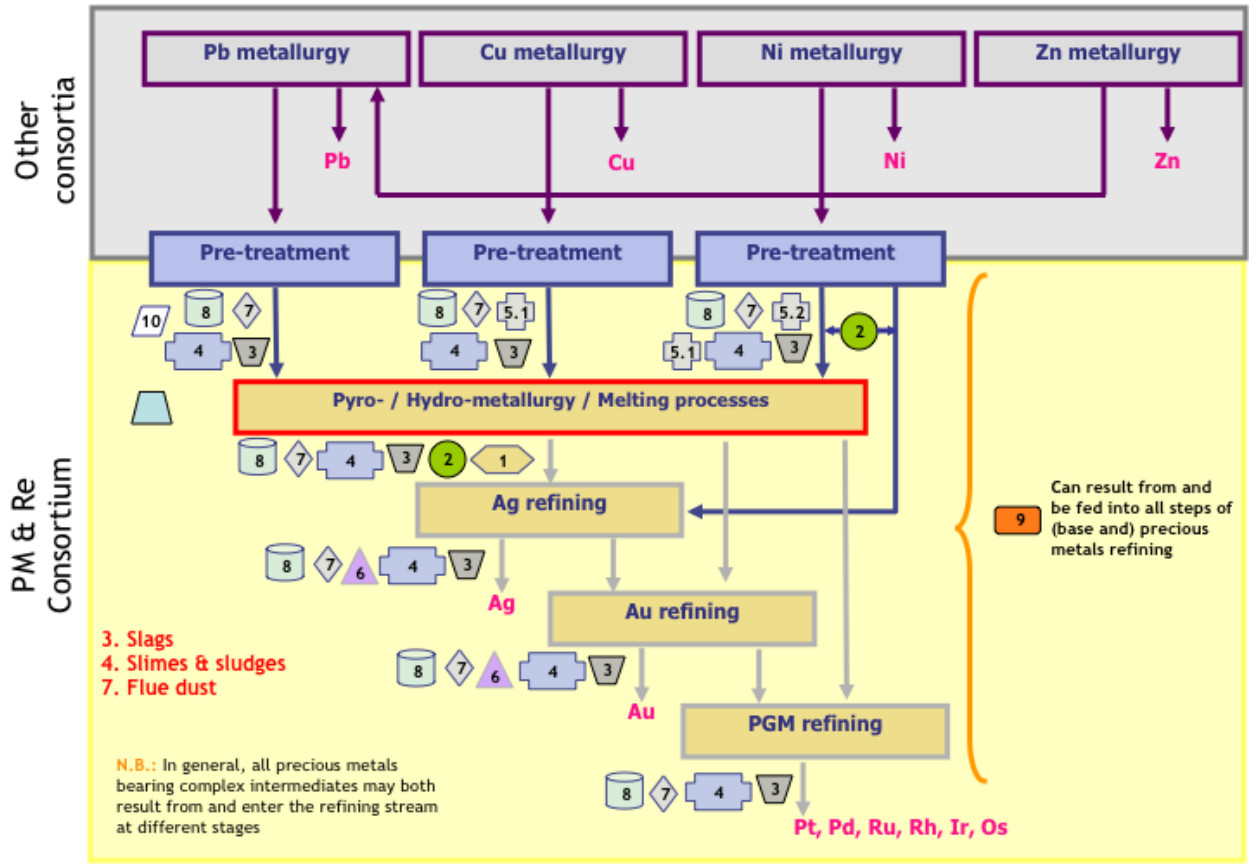
Refinables Project

Proposed strategy to split PM slags, slimes & sludges, flue dust - DRAFT

BACKGROUND

Precious metal (PM) Refinables are complex inorganic substances containing varying amounts of metals, metal compounds and/or minerals, which are manufactured during the various refining steps involved in the production and/or recovery of PMs. They are identified as UVCBs. UVCB in the metals sector have a known composition but large spatial and temporal heterogeneity and variability in compositions and physical forms.

According to the ECHA Guidance for identification and naming of substances under REACH and CLP, the consequence of defining a substance as UVCB is that any significant change of source or process would likely lead to a different substance that should be registered again. However, reality in the PM sector demonstrates a same Refinable can originate from different sources and process (steps); see below flowsheet.



At its 13 December 2012 meeting, the PM Refinables WG agreed that identification, sameness check, and grouping of streams in the following UVCBs could reasonably be challenged by ECHA:

- Slags, PM refining;
- Slimes and sludges, PM refining;
- Flue dust PM refining.

For these Refinables, several sources/processes were originally grouped under the same Refinable, on the basis that they are usually captured, collected and/or treated without distinction and that even if they were considered separately (following a theoretical approach) their variability and hazard profile would not be significantly different. However, even considering the reality of the PM sector, ECHA may consider them to be over-grouped.

It was hence agreed to set-up a task force in charge of exploring possible criteria and approaches which could be considered to split the above entries in an objective manner, using:

- source and process information of slags, slimes & sludges and flue dust in scope (i.e. only including those from PM refining, not other NFM, and not including e.g. slags used as aggregate);
- the NFM industries BAT Reference document (BREF);
- available information from splitting exercise done previously.

Volunteers for this task force are Daniela Cholakova, Edwin Broeckaert, Mike Shepherd and Hege Stubberud.

This document is a summary of the task force's recommendation to the Refinables WG for discussion, refinement and iteration, and approval.

1. SLAGS, PM REFINING

The proposed criteria to split these are:

a) **Process** they originate from (e.g. slags from pyro-metallurgical processes and slags from melting processes). It is noted that all slags originate from hot processes, and there are no slags resulting from hydro-metallurgical operations.
b) **Process and flux** they originate from (e.g. slags from pyro-metallurgical processes using borax, slags from melting processes using carbonates, etc.), depending on the influence of the flux on the assessment. It is noted that the classification cluster analysis revealed that flux did not systematically influence classification clusters. From all fluxes, boron ones are more likely to influence the assessment.

Using the PM refining they result from (Ag/Au/PGM refining) as a criterion is not applicable since pyro-metallurgical processes are applied on materials containing more than one PM.

Proposed actions:

- **Consider options a) and b) above and refine splitting approach based on composition of slags per process (initial smelting step/large composition versus further refining step/narrower composition).**
- **Check with Frederik Verdonck if flux determines classification and possibly risk assessment.**
- **Determine availability of other EC numbers applicable to PM refining slags for splitting of slags.**

2. SLIMES & SLUDGES, PM REFINING

The proposed criterion to split these is a combination of the **process** they originate from (e.g. slimes and sludges from hydro-metallurgical processes, slimes and sludges from wet treatment of by-products produced during melting processes) and the **PM refining** (Ag/Au/PGM refining) they result from.

It is noted that we need to distinguish between:

1) slimes and sludges from non-PM refining used as input in PM refining and covered in another registration;
2) the true PM refining slimes and sludges;
3) slimes and sludges obtained from hydro-metallurgical processes in order to concentrate the PM and used as input in PM refining.

Borderline cases:

- Some slimes and sludges from other sectors are subject to pre-treatments during which they are chemically modified and are considered as PM refining slimes and sludges after they are treated as part of a PM operation
- Slimes and sludges typically originate from wet processes. Pyro-metallurgical processes do not generate slimes and sludges, some of the residues of pyro-metallurgical processes can however be leached as part of a PM operation and then become a PM refining slime and sludge (i.e. after pre-treatment).

Proposed actions:

- **Consider one group per process and PM family (Ag, Au, and PGM) and possibly an additional group to cover borderline slimes and sludges.**
- **Check the flowsheets of all companies and check where we can split.**
- **Determine availability of other EC numbers applicable to PM refining slimes and sludges for splitting of slimes and sludges.**

3. FLUE DUST, PM REFINING

The proposed criterion to split these is the **process** they originate from. This would result in 3 subgroups:

1) Flue dust from pyro-metallurgical (smelting) processes;
2) Flue dust from melting processes;
3) Flue dust from calcination, incineration and drying processes.

However, because flue dusts are usually collected in a centralised system, and their manufacture and use stage take place under the same conditions (always pyro-), the assessment of individual subgroups could be difficult.

Proposed action:

- **Check variability of composition across 3 groups above based on ARCHE's database of composition information before deciding on whether to split (and assess separately) or keep in one group.**
- **Determine availability of other EC numbers applicable to PM refining flue dust for splitting of flue dust.**