Precious Metals & Rhenium Consortium
PM Refiners Work Group meeting

BRUSSELS, 25 MARCH 2015, 09:00-12:00

1. Welcome and introduction

EDWIN BROEKAERT

1.1 Confidentiality and competition law

DO	DON'T
Application of competition law	
Art. 101 and 102 TFEU may be applicable to the conclusion of any preliminary agreement and activities of any preliminary phase.	Don't assume that conflicts with competition law are excluded simply by the fact that the Agreement complies with the provisions of the REACH Regulation.
Consultation in Matters of Competition Law	
Consult an in-house legal expert or the compliance officer of your company or an external lawyer whenever there are uncertainties respecting compliance with competition law. Stop all meetings/discussions which are not in compliance with these Compliance Guidelines until a legal expert has been involved.	Don't assume that these Compliance Guidelines deal with all competition law issues exhaustively. Basically, compliance with Art. 101 and 102 TFEU can be determined only on the basis of market impact in each individual case. These Compliance Guidelines may therefore be regarded only as a means of providing general conduct recommendations.
Activities in any preliminary phase and at any other stage of operation of the Consortium	
Restrict cooperation within the scope of the preliminary phase to the initially defined goals and purposes of the cooperation.	Pursuant to Art. 101 and 102 TFEU, activities which have the object of the effect of preventing, restricting and/or distorting competition are prohibited within the scope of this Agreement, including: - Coming to agreement, including arrangements or collusions, about prices, markets and customers (see Art. 101 paragraph 1 a)-e) TFEU); - Joint boycotting of other companies; - The unjustified unequal treatment of trade partners; - The abusive exploitation of a dominating market position.
Exchange of Confidential Information	
Involve a Trustee for the exchange of Confidential Information.	The exchange of Information concerning market behaviour and having the object or the effect of preventing, restricting and/or distorting competition is inadmissible; in particular, this relates to : - Production capacities; - Productions or sales volumes; - Import volumes; - Market shares; - Price policy; - Distribution and marketing terms; - Marketing strategies; - Information regarding the relationship with suppliers.
Documentation on Cooperation	
Keep minutes of all meetings which detail the subject of the meeting. In case of uncertainty, have the contents of the minutes reviewed by an external legal expert prior to sending them to all parties of the Agreement. Stop all meetings which are not in compliance with these Guidelines until a legal expert has been involved.	

1.2 Tour de table and apologies

List of Participants

- Angela Alderman (Johnson Matthey, United Kingdom)
- Massimo Blattner (Valcambi, Switzerland)
- Dave Boyd (Consultant, United Kingdom)
- Roland Brasch (Heraeus, Germany)
- Edwin Broekaert (Umicore, Belgium)
- Jan Drzymalla (Aurubis, Germany) - *by phone*
- Paul Frost (Glencore, United Kingdom)
- Dirk Hadlich (Saxonia, Germany)
- Mark Hosford (Johnson Matthey, United Kingdom)
- Becky Marks (WCA, United Kingdom)
- Agnieszka Piechota (KGHM, Poland)
- Nissanka Rajapakse (Johnson Matthey, United Kingdom)
- Jutta Schade (EBRC, Germany)
- Sven Schmitt (Heraeus, Germany)
- Mike Shepherd (Vale, United Kingdom)
- Ed Stutt (WCA, United Kingdom)
- Erik Teubel (Saxonia, Germany)
- Mika Toivola (Boliden, Finland)
- Daniel Vetter (EBRC, Germany)
- Carole Wilson (Vale, United Kingdom) - *by phone*

Secretariat

- Katrien Arijs (EPMF, Belgium)
- France Capon (EPMF, Belgium)

Apologies

- Christoph Roehlich (Heraeus, Germany)
- Hege Stubberud (Glencore, Norway)

1.3 Approval of the agenda

1. Welcome and introduction
2. Substance identity (SID) of PM Refinables
   - 2.1 Further information from ECHA
   - 2.2 Structural representation of PM Refinables: Example PM slags and agreement on way forward
   - 2.3 Process descriptions of PM refining
     - 2.3.1 Decision tree: Discussion and approval
     - 2.3.2 Definitions: Discussion and approval
3. Status of environmental exposure assessment of PM Refinables
4. Update on activities Eurométaux related to inorganic UVCBs
5. Workplan and budget
6. A.O.B., next meetings/calls and closing remarks
   - 6.1 ECHA CMR review
   - 6.2 Authorisation and recycling

1.4 Minutes and actions 10 Oct 2014 (1)

	What?	Who?	Status?
	Environmental assessment		
1.	Keep WCA informed of developments at EM level regarding assessment of iUVCBs	PMC Sec	Ongoing
2.	Return env. exp. questionnaire with <u>all</u> available emissions data on the driving constituents present in the PM Ref at their site	PM Ref WG	Ongoing - REMINDER
3.	Changes/additions for the next update: • Compilation of emission data from questionnaires to update the env. RA • Improve/extend consideration of combined toxicity	WCA	Ongoing
4.	Sign data-sharing agreements for all driving constituents	PMC Sec	Ongoing
	Substance identification (SID)		
5.	Contact ECHA on procedure to split dossiers	PMC Sec	After SID check
6.	Check with PM Ref WG who wants to join the PM Ref Sameness Expert Group	PMC Sec	
7.	Organise meeting of the PM Ref Sameness Expert Group	PMC Sec	Done
8.	Define hydro-, electro- and pyro-metallurgical processes (based on the BREF?)	C. Roehlich	
9.	Draft action list on what needs to be done when splitting PM Ref, incl. administrative actions	PMC Sec	Ongoing
10.	Update SID decision tree following comments made at the meeting	PMC Sec	Done
11.	Finalise SID decision tree, decide on need for splitting and draft document explaining the PM Ref WG's approach to SID and justifying the steps we have already taken	PM Ref Sameness EG	Ongoing
12.	Collect updated LE specific compositions to further refine SID (composition + speciation)	PMC Sec	Ongoing
13.	Perform further speciation analysis where needed	PMC Sec	Only if needed
14.	Update ID cards and IUCLID files following refinement SID / splitting	PMC Sec with WCA & EBRC	By end 2015

Minutes and actions 10 Oct 2014 (2)

What?		Who?	Status?
Classification			
15.	Perform 28d TDP test on Doré to refine the classification	PMC Sec	Q1-Q2 2015
16.	Check if STOT SCL for Pb compounds has been updated, change formulas in the classification-related compositions into elemental compositions where possible and update IUCLID files	ARCHE	Q3 2015
Human health & occupational assessment			
17.	Changes/additions for the next update: • Content improvements of exposure assessment documents (methodology and ES part) • Update of risk characterisation • Improvement of current IUCLID files/CSRs • Improve/extend uncertainty analysis • Improve/extend consideration of combined toxicity • MvE assessment: follow up Eurométaux approach	EBRC	Ongoing
Phys-chem testing			
18.	Check for which substances TDP testing may be needed	PMC Sec	After AP11
19.	Have TDP tests conducted at ECTX for Flue dust and other Refinables identified in AP18	WCA	After AP18
Updates			
20.	SIEF communication together with the LoA Agreement/price announcement	PMC Sec	Ongoing
21.	Update dossiers for Ag and Au electrolytes (SCC intermediates) as needed	PMC Sec with WCA & EBRC	Ongoing
22.	Finalisation of updates CSRs and IUCLID files	WCA, EBRC & PMC Sec	Early 2016
23.	Check who needs MSDS translations so costs can be shared	PMC Sec	Q1 2015
24.	Produce generic (e-)MSDS contents using standard phrases	WCA	Q1-Q3 2015

2. Substance identity (SID) of PM Refinables

KATRIEN ARIJS

2.1 Further information from ECHA

ECHA Substance Identification and Sameness Workshop 6-7 Oct 2014

- Focus on SID and substance sameness (‘who can register together?’) of UVCBs.
- ± 60 participants: 1/3 MSCA, 1/3 stakeholders and 1/3 ECHA staff.
- Presentations from ECHA, MSCA and industry (chemical, petroleum, metal) + discussion in breakout groups (different industry groups) on how to assess sameness of UVCBs.
- Proposed 3-step sameness methodology (cf. next slides), which requires considerations on the description of the composition to be made first. The structural depiction relies on the “80% rules” established for well-defined substances.
- The proposed methodology allows registrants to deviate from the rules for setting the substance sameness criteria, as it can be done for well-defined substances. The deviation must however be clearly and transparently justified.
- Background doc and workshop report available on ECHA website.

ECHA Substance Identification and Sameness Workshop 6-7 Oct 2014 (1)

Proposed substance sameness criteria

1) Identify the parameter(s), if any, allowing a structural representation of the substance
2) Identify any additional necessary parameter(s) necessary to represent the substance by the reaction scheme
3) Identify any additional necessary parameters necessary to represent the substance by the process

The combination of these parameters set the criteria for substance sameness

ECHA Substance Identification and Sameness Workshop 6-7 Oct 2014 (2)

ECHA
EUROPEAN CHEMICALS AGENCY

Structural representation

- Starting point: structural representation of well-defined substances
  - Achieved by the "80% rules"
    - 80% rule (mono-): No need to go beyond representing 80% of the composition of a substance
    - 80-10% rule (multi-): When it is not possible to define 80% of the composition by a unique structural depiction, a structural (qualitative) representation of the composition based on the identity of the main constituents is considered
- The structural depiction of well-defined substances is normally sufficient to determine if substances can be registered together
  - Same structural depiction → substances can be registered together
  - Different structural depiction → substances cannot be registered together

ECHA Substance Identification and Sameness Workshop 6-7 Oct 2014 (3)

ECHA
EUROPEAN CHEMICALS AGENCY

UVCB substance depicted as the output of a process

- According to the EINECS reporting rules, the depiction essentially consists of
  - Identity of the precursors
  - Technology
  - 'typical' composition

- Outputs from processes relying on different sources or process technologies would in principle not refer to the same substance

- 'Typical' composition is taken care of at the level of the structural depiction according to the proposed methodology

ECHA Substance Identification and Sameness Workshop 6-7 Oct 2014 (4)

ECHA
EUROPEAN CHEMICALS AGENCY

Note on the depiction of the technology

- The depiction must be proportionate
  - Different process parameters (e.g. reaction temperature 100^{o}C vs. 120^{o}C, pressure) do not necessarily mean that the technology depiction will be different

- If the inherent variability does not allow the definition of a technology parameter, such parameter should not be used as a substance sameness criteria
  - Example: identity of secondary sources

→ Focus on the parameters that matter!

→ Definitions of EINECS-listed UVCB substances as a reference for the technology depiction

ECHA Roadmap for 2018 REACH registration deadline: SID actions

- Well-documented, unambiguous SID is essential for a solid registration, and all other information in the registration will be mirrored against it.
- ECHA SID guidance is lacking information for certain complex substance types, such as **UVCBs**

  -> ECHA will continue collaboration with sector-specific groups to develop sector-specific SID guidance to assist registrants (where relevant, within the framework of the OECD).

- The ECHA SID Guidance has a section on **substance sameness** but text currently limited in its scope and depth, in particular for UVCBs

  -> ECHA is developing possible solutions for a further structured approach on substance sameness that were discussed amongst key stakeholders in a workshop in Oct 2014. The international chemicals management arena may also need to be considered in the discussions to try to move some way to an internationally harmonised system.

Milestones:

- Methodology established for substance sameness (2015).
- Potential review of the Guidance on Substance Identification and Naming or other types of material for addressing substance sameness (2015).

Board of Appeal case A-008-2012

- **Substance**: SDA Product (desulphurization of exhaust gases by semi-dry absorption method from the coal fired power plants).
- **Manufacturing process**: desulphurization carried out with preliminary dust (ash) extraction step but also with partial or no dust extraction -> 'pure SDA' or 'mixture SDA Product and ash'.
- ECHA concluded the registration dossier contained information on **more than one substance** -> separate registrations needed.
- The application or non-application of a dust extraction step in the process resulted in **systematic differences in compositions** -> composition was considered the root cause for differentiating between substances (regardless of whether they have the same hazard properties).
- 'Mixture SDA Product and ash': output is the result of the same process and would therefore be considered a single substance for registration purposes + 2 substances cannot be physically separated.

2.2 Structural representation of PM Ref

- ECHA proposed methodology sets priority to the **structural representation** followed by the reaction scheme and the process output.
- The methodology entails the identification of systematic structural characteristics which, if the substances were to be well-defined, would constitute substance sameness criteria. The structural depiction therefore relies on the "**80% rules**" established for well-defined substances.
- ECHA SID guidance:
  - "≥ 80%" rule for mono-constituent substances (i.e. one main constituent present to at least 80%) as well as the "< 80%/≥ 10%" rule for multi-constituent substances (i.e. several main constituents present at concentrations ≥ 10% and < 80%) should be applied to check if substances are the same.
  - Well-defined substances should contain the same main constituent(s).
  - A multi-constituent substance of main constituents A, B and C shall not be regarded the same as a multi-constituent substance of main constituents A and B or as a reaction mass of A, B, C and D.

Structural representation of the Slags, doré furnace (1)

- Oxide content of the slags was not reported but calculated based on the elemental composition and speciation information reported by members.
- Main constituents where then identified both for the speciation and the elemental composition.
- Main constituents – species

> 10% → Max typical conc (%)

	Ag	BaO	Cu2O	Fe3O4	Na2O	PbO	Sb2O3	SiO2	SnO2	Sum
Min typical conc (%)	1,4	0,0	1,1	0	0	0	0	0	0	
Max typical conc (%)	13,4	20,2	47,7	29,3	16,3	50,9	13,0	27,9	11,4	
Average typical conc (%)	**4,6**	**5,6**	**14,6**	**5,1**	**4,0**	**33,4**	**4,2**	**12,6**	**3,3**	**87,4**

> 10%

Slag code	Sum main constituents - species (%)
1	86,6
2	89,0
3	92,8
4	91,1
6	65,1
7	92,5
8	94,8

Slag code	Cu2O	PbO	SiO2	Sum
1	2,5	39,1	12,6	**54,1**
2	4,9	37,9	23,8	**66,6**
3	17,1	50,3	16,7	**84,1**
4	25,4	50,9	7,5	**83,8**
6	3,7	15,9	0,0	**19,6**
7	47,7	0,0	0,0	**47,7**
8	1,1	39,7	27,9	**68,7**

Structural representation of the Slags, doré furnace (2)

- Main constituents – elements

> 10%

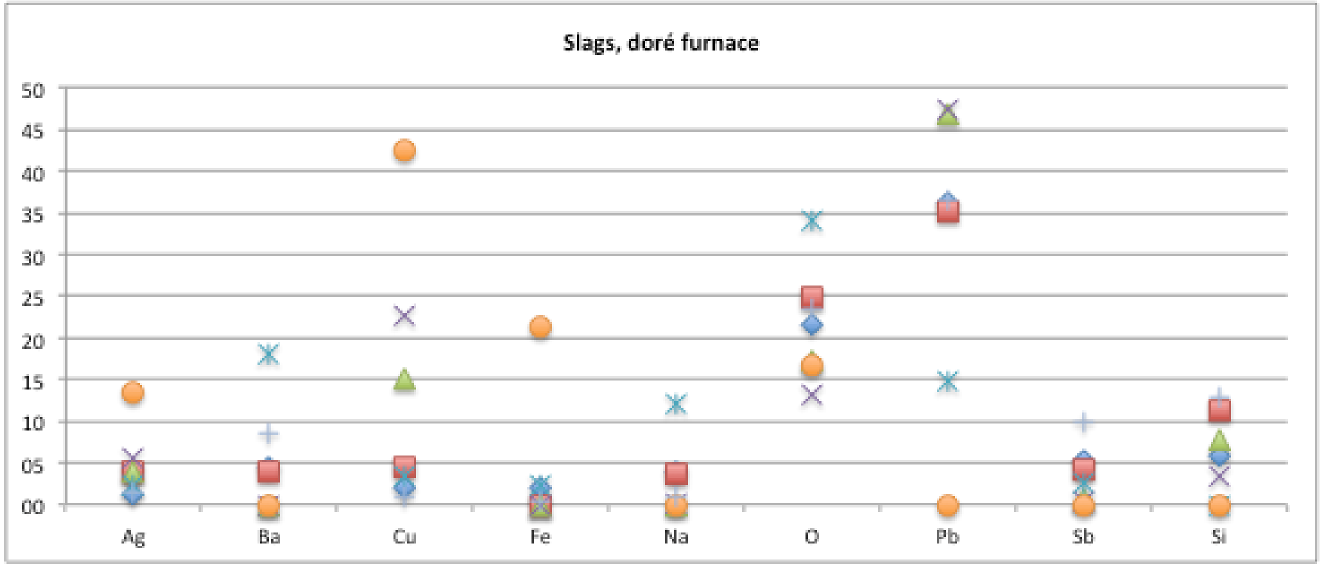
	Ag	Ba	Cu	Fe	Na	O	Pb	Sb	Si	Sum
Min typical conc (%)	1,4	0	1,0	0	0	13,2	0	0	0	
Max typical conc (%)	13,4	18,0	42,4	21,2	12,0	34,0	47,3	10,0	12,9	
Average typical conc (%)	**4,6**	**5,0**	**13,0**	**3,7**	**3,0**	**21,6**	**31,0**	**3,3**	**5,9**	**91,0**

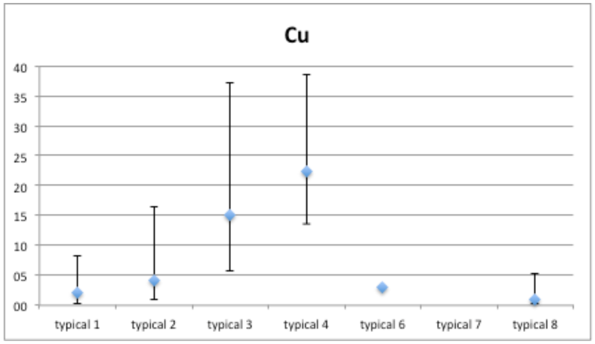
> 10%

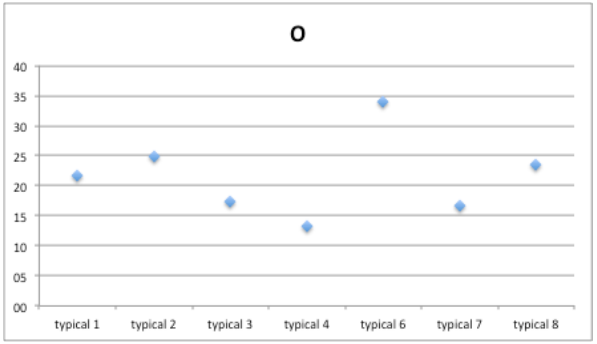
Slag code	Sum main constituents - elements (%)
1	83,0
2	91,1
3	91,5
4	92,7
6	89,3
7	93,6
8	95,5

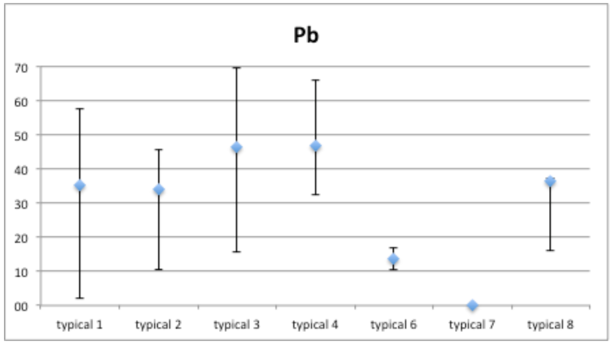
Slag code	Cu	O	Pb	Sum
1	2,2	21,6	36,3	**60,0**
2	4,4	24,8	35,1	**64,3**
3	15,2	17,3	46,7	**79,2**
4	22,6	13,2	47,3	**83,0**
6	3,3	34,0	14,7	**52,0**
7	42,4	16,7	0,0	**59,1**
8	1,0	23,5	36,6	**61,1**

Structural representation of the Slags, doré furnace (3)









Structural representation of the Slags, production of PM ctg. mat. other than doré (1)

- Oxide content of the slags was not reported but calculated based on the elemental composition and speciation information reported by members.
- Main constituents where then identified both for the speciation and the elemental composition.
- Main constituents – species

	Al_2O_3	CaO	Fe_2O_3	Na_2O	SiO_2	Sum
Min typical conc (%)	4,7	1,8	4,2	0,1	26,9	
Max typical conc (%)	17,6	27,2	11,6	50,9	41,6	
Average typical conc (%)	**11,2**	**11,3**	**8,0**	**19,3**	**33,2**	**82,9**

> 10% → Max typical conc (%)

> 10%

Slag code	Sum main constituents - species (%)
1	86,0
2	77,7
3	76,6
4	91,4

Slag code	Al_2O_3	CaO	Na_2O	SiO_2	Sum
1	12,9	27,2	0,1	41,6	81,9
2	17,6	11,4	3,3	33,8	66,1
3	9,5	4,7	22,9	30,5	67,6
4	4,7	1,8	50,9	26,9	84,3

Structural representation of the Slags, production of PM ctg. mat. other than doré (2)

- Main constituents – elements

> 10% →

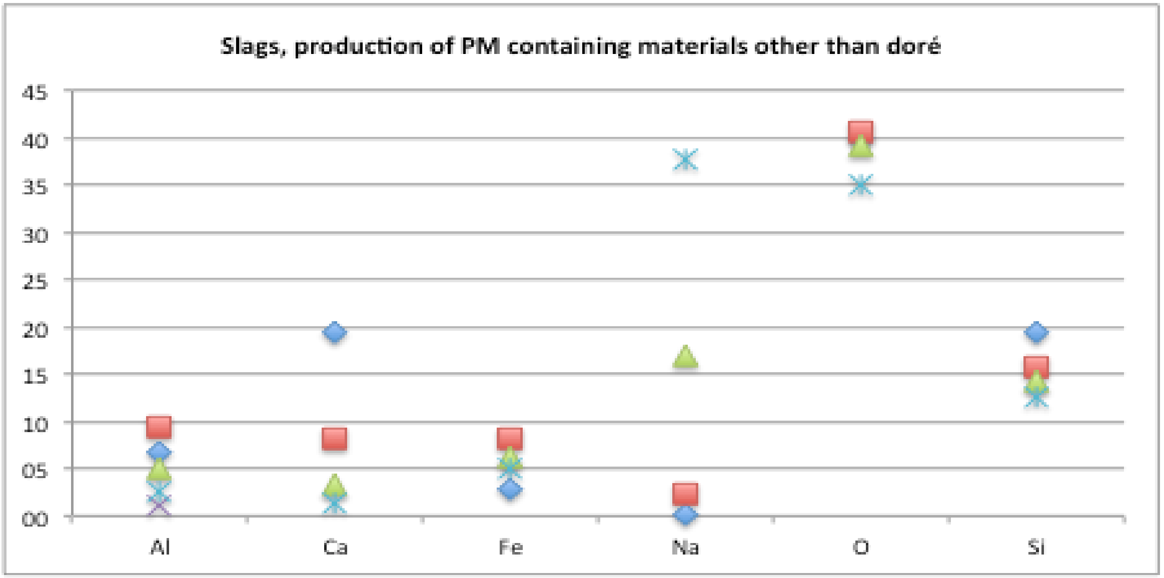
	Al	Ca	Fe	Na	O	Si	Sum
Min typical conc (%)	2,5	1,3	2,9	0,1	35,1	12,6	
Max typical conc (%)	9,3	19,5	8,1	37,8	40,7	19,5	
Average typical conc (%)	**5,9**	**8,1**	**5,6**	**14,3**	**38,7**	**15,5**	**88,1**

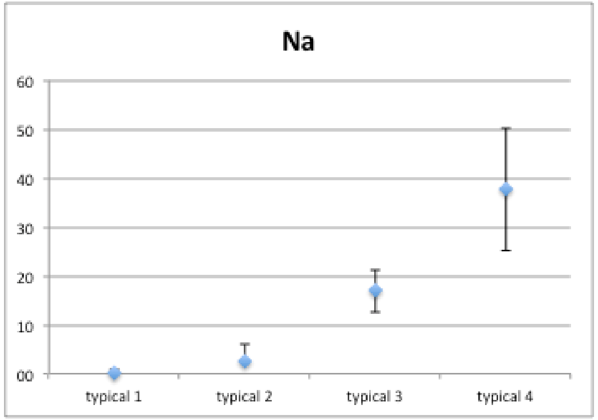
> 10%

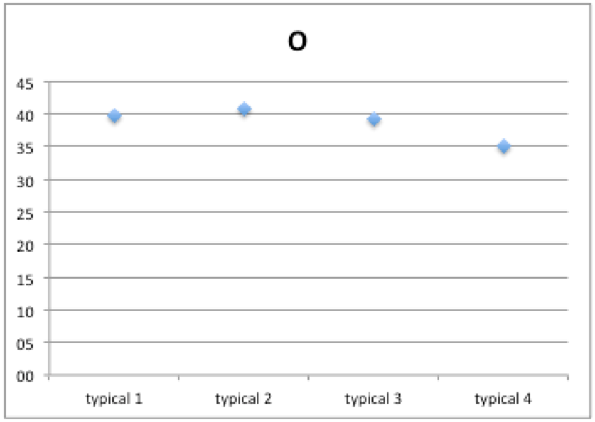
Slag code	Sum main constituents - species (%)
1	88,6
2	84,5
3	85,1
4	94,2

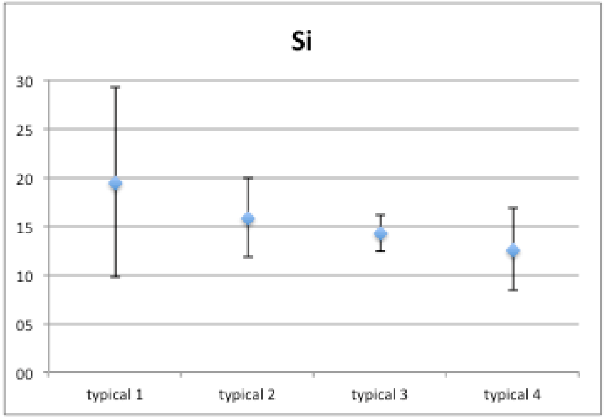
Slag code	Na	O	Si	Sum
1	0,1	39,8	19,5	59,4
2	2,4	40,7	15,8	58,9
3	17,0	39,2	14,3	70,4
4	37,8	35,1	12,6	85,5

Structural representation of the Slags, production of PM ctg. mat. other than doré (3)









Structural representation of the slags: conclusions

- Two approaches were used for the structural representation: the species and elements representation. The **elements representation** is most in line with how the composition was reported in the Registration Dossiers of the Refinables, so it is recommended to use this.
- If the main (elemental) constituents are defined in line with the ECHA SID guidance (i.e. typical conc. for main constituents should be ≥ 10%), we can show **presence of the same main constituents across companies for both types of slags** (with the exception of 2 slags, for which composition needs to be double checked). However, when using this approach, we cannot define sameness up to 80%, but we can justify this based on the presence of a lot of 'minor' constituents in the Refinables (present in small concentrations).
- If the structural representation of the Refinables is defined up to 80% (i.e. by also taking into account 'minor' constituents), then we cannot show presence of the same constituents across all companies, because we have to take a lot of constituents into account (9 elemental constituents for the Doré slags).

Overall, for the slags, if we define the main constituents in line with the ECHA SID guidance, we can show presence of the same main constituents across companies, but we cannot prove sameness up to 80%.

Concerns raised by members: ECHA SID guidance using the “>10% and 80%” rules is not going to be flexible enough for our needs and we will have to further split the slags (and other Refinables) to achieve satisfactory substance sameness.

2.3 Process descriptions of PM refining

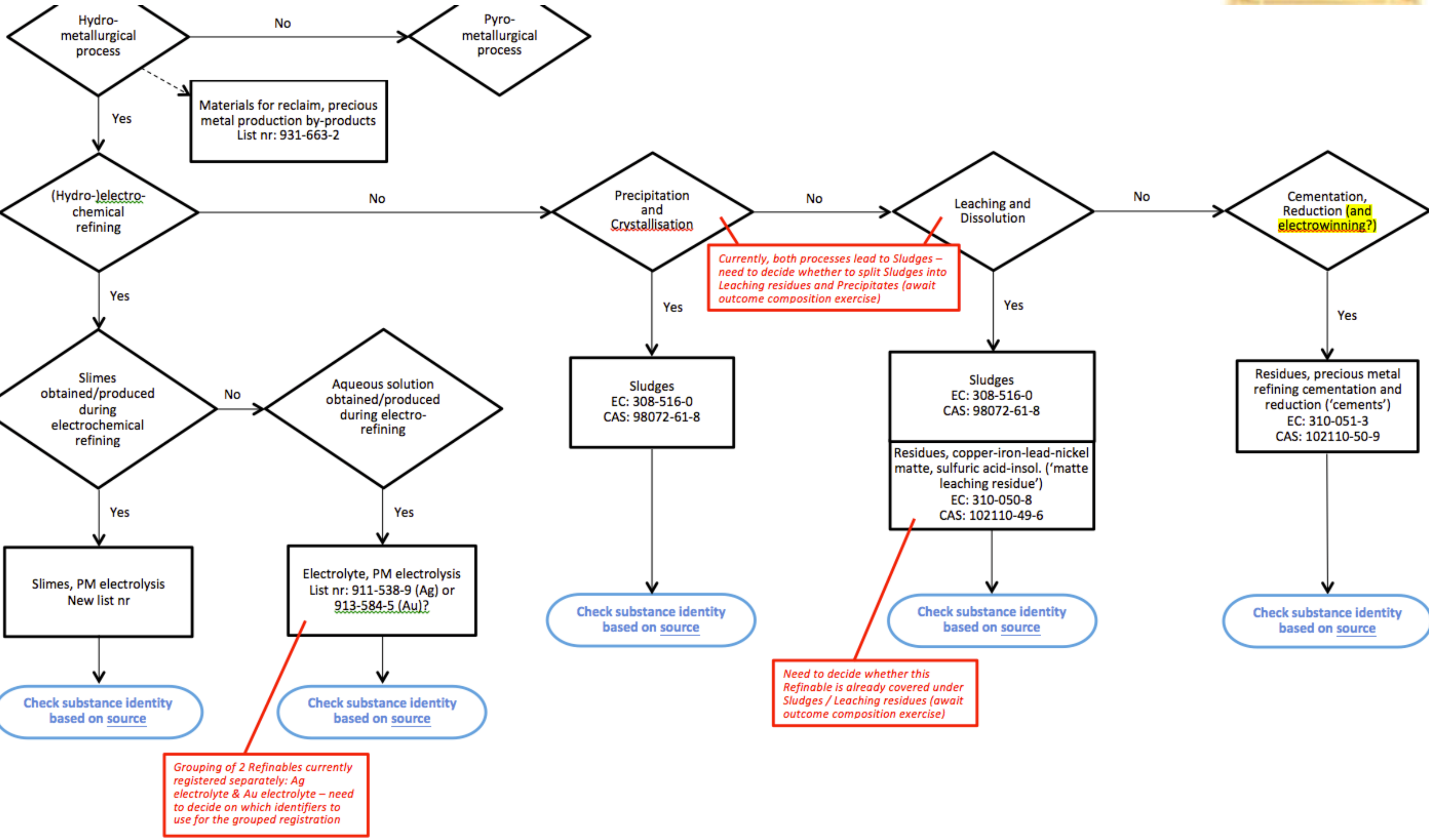
- Original SID of Refinables started from EINECS entries
- Decision tree: start from refining processes, assign Refinables and check if no over-grouping was done
- Updated version decision tree circulated following meeting Sameness Expert Group
- Consists of 3 parts with references to the various parts as applicable
- Processes are split in hydro- and pyro-metallurgical processes (part 1-2).
- Part 3: SID checked for all Refinables based on the source -> SID validation step rather than an SID determination step (justification why we are grouping several sources for the same Refinable)
- Complemented with list of processes + definitions drafted by C. Roehlich and discussed by Sameness Expert Group

Hydro-metallurgical processes

Metallurgical processes that occur in an aqueous, water-containing or water-like medium, and are mainly mediated by substances’ reactivity in this medium, i.e. their solubility, speciation, ligand coordination, acid/base and redox behaviour.

Typical hydrometallurgical processes include dissolution, leaching, precipitation, crystallization, ion exchange, adsorption, extraction, distillation, reduction/cementation, and also electrochemical processes.

Hydro-metallurgical processes: decision tree



Hydro-metallurgical processes: definitions (1)

Leaching and Dissolution

- **Leaching**: intended dissolution and removal of at least one part or component from a material, leaving at least one other part of the material undissolved (incl. "washing" with neutral, acidic or basic solutions; as well as reactive distillation). Leaching can also be performed in conjunction with a chemical transformation or modification of at least one part of the material (e.g. to suppress its dissolution).
- **Dissolution**: process intended to dissolve the whole material. However, there is not always a guarantee that a dissolution process will be able to actually dissolve the whole material, or during the process new insoluble components are formed, which then precipitate.

➔ Solid residues: **Residues from Leaching and Dissolution** (*Sludges; Matte leaching residue*)

Decide on need for grouping based on structural representation

Precipitation and Crystallization: formation of an insoluble compound from a dissolved species by addition of a precipitation agent or changing the medium's characteristics (concentration, temperature, pH, polarity).

➔ Solid precipitate: **Precipitates from PM Refining** (*Sludges*)

Decide on need for splitting based on structural representation

Hydro-metallurgical processes: definitions (2)

Cementation, Reduction, Electrowinning: targeted creation of a metal in its elemental/metallic state from a dissolved species by the addition of a reduction agent (e.g. a more electropositive metal = cementation; reduction agents like hydrazine, formaldehyde etc. = reduction; enforced by an electric current = electrodeposition, electrowinning).

➔ Metallic precipitate: ***Residues, PM refining cementation and reduction***

Adsorption: PMs can be removed from solutions by contacting the solution with a solid phase. The PM is depleted from the solution and collected on the solid phase by:

- physisorption (= physical adsorption),
- electrostatic attraction (= ion exchange) or
- the formation of a chemical bond (= chemisorption; scavenging).

When the solid phase has reached its end of life, it is sent to Refining to reclaim the PM content. Since this is an end-of-life product, and not different from e.g. a spent heterogeneous catalyst, it is grouped with ***Materials for Reclaim, PM with or without support*** (see below).

Hydro-metallurgical processes: definitions (3)

Solvent Extraction: intense contacting of two immiscible liquids. Some dissolved species are transported from one liquid to the other (by higher solubility in the other liquid, ion exchange phenomena, chemical bond formation, etc.): they are extracted. The liquid phases are separated from each other. The liquid phase carrying the extracted species can be contacted with a third immiscible liquid to remove an extracted species again ("stripping", back-extraction). Throughout the consortium, solvent extraction is performed in a way that no process-specific intermediates/Refinables are isolated and would need to be registered.

Electrochemical refining ("electrolysis"): Electrochemical Processes are mediated by a passage of direct electric current from an external source through a medium, resulting in a chemical (redox) reaction at the electrodes. In the PM industry, this is mostly referring to *Electrochemical refining*: The simultaneous electrochemical dissolution of crude metal at one electrode and electrochemical deposition of higher purity metal on the other electrode, while the impurities are collected as a solid forming and precipitating in the medium ("anode slime"), or remain in the electrolyte.

→ ***Slimes, PM electrolysis*** and ***Electrolyte, PM electrolysis***

Decide on differentiation between Ag and Au electrolytes/slimes based on source/structural representation

Pyro-metallurgical processes

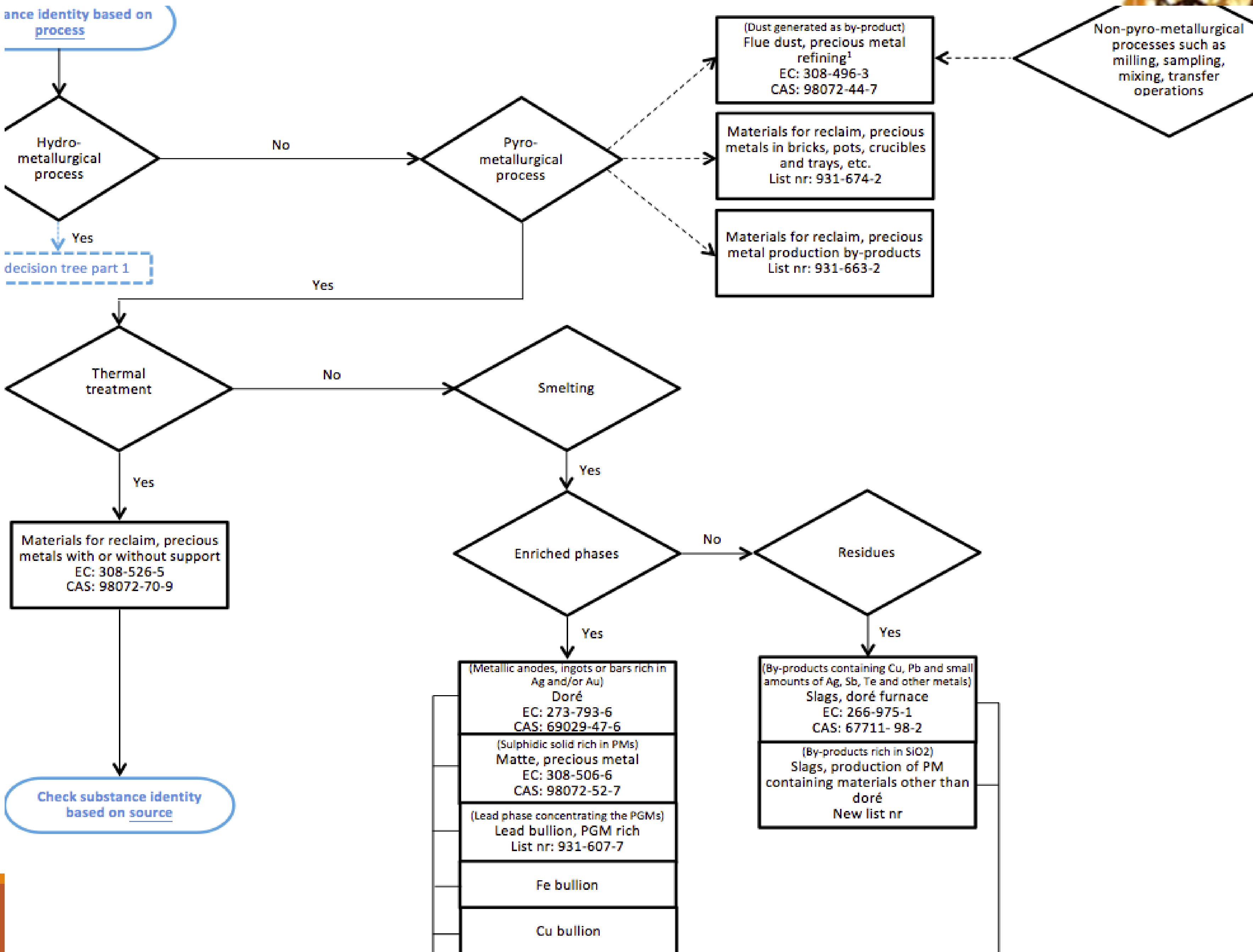
Metallurgical processes mediated and dominated by high temperatures. The high temperature is used to

- (Create and) remove volatile components,
- Adjust the chemical or physical form of a material,
- Enforce a (otherwise usually slow or incomplete) chemical reaction, e.g. between a solid and a gas,
- Or to melt materials that are otherwise solid at ambient temperature, and make use of their properties and reactivity in their molten state.

Typical examples of pyrometallurgical processes include roasting, sintering, calcining, chlorination, fusion, melting and smelting.

For completeness should we not also include drying (i.e. <180 °C) and state that the output material is identical to the input material and doesn't need to be registered?

Pyro-metallurgical processes: decision tree



Pyro-metallurgical processes: definitions (1)

Sintering: heating a solid substance to a t°, at which it is not or only partially melted, and particles start to adhese and build agglomerates and larger, more robust structures

➔ not accompanied by a chemical reaction, output material = input material ➔ not a different Refinable

Thermal treatment: heating to enforce a certain reaction of the material that only occurs at higher t°. These reactions usually include decomposition of the material itself, yielding more volatile compounds (calcination, pyrolysis); or the reaction with a (reducing or oxidizing) gas (incineration, roasting, chlorination, reduction); reaction with a molten flux (fusion); and removal of volatile compounds (drying, fuming).

➔ in reality, the material actually undergoes several of these processes during a thermal treatment simultaneously.

➔ group processes that include the heating of a material in a gas atmosphere (inert, oxidizing or reducing) without a solvent, and/or only under partial melting of the material

➔ ***Materials for Reclaim, PM with or without support***

These residues are the same as what is later described as definition for the PMs with/without support. Do we need further justification here? Are we putting too many streams here and are we thus overgrouping?

Pyro-metallurgical processes: definitions (2)

Smelting: process to separate PM from usually insoluble materials. To accomplish that, the material is mixed with additives/fluxes, and heated up to melting. In contrast to a Melting process, chemical reactions now take place, which usually cover the reduction of PMs and other metals in the material by a reduction agent, oxidation of less noble metals by an oxidant, alloy formation between metals, mixed sulfide formation, as well as mixed oxide formation. In contrast to a Fusion process, a smelting process results in two liquid phases which are immiscible and thus separated from each other: A **slag** (containing mixed oxides, fluxes,…) and an **Enriched Phase** (Alloys = Doré, Lead bullion PGM rich, Fe bullion?, Cu bullion?; PM-containing sulfides = matte, precious metal).

➔ ***Slags, doré furnace***; ***Slags, production of PM contg. materials other than doré***

➔ ***Doré; Matte; Pb bullion PGM rich; Fe bullion?; Cu bullion?***

Melting: Heating a solid substance to or above a t° at which it becomes a liquid. Usually this is performed to change the phys. form of a material, like granulation or ingot casting.

➔not accompanied by a chemical reaction (in contrast to smelting and fusion processes), output material = input material ➔ not a different Refinable

Unspecific processes that lead to production of PM contg. material

Materials for Reclaim: originate from the production, processing, or use of PM-containing materials and products.

Dust collection: In many processes during production or processing, also refining, of PM-contg. materials, dusts are generated and collected in appropriate facilities. These processes can include milling, thermal treatment, melting, smelting, grinding or polishing. Commonly, dusts from several processes are collected through a single exhaust gas filtering system at a site. This mixture of filter dusts is then sent to Refining to reclaim the PM ➔ ***Flue Dusts, PM Refining***.

Mechanical cleaning: It is common practice in PM processing industry to clean floors and equipment regularly, to collect any residues of PM-contg. material on them and reclaim the PM value. The resulting scraps, sweeps and cleaning tools (like swipes) are usually collected from several facilities and processes and combined before sent to refining as ***PM production by-products***.

Equipment to process PM-contg. materials: Parts of an equipment in which PM is processed can become contaminated permanently with PM, which has to be reclaimed when it has reached its end of life. These are sent to Refining as ***PMs in bricks, trays, crucibles etc.***

Use of PM products: variety of products based on PM for a plethora of applications; these include catalysts, jewelry, dental alloys, sensors, wires, sputter targets, solders, pastes, plating solutions, and many more. Due to their PM content, any end of life product as well as out-of-spec products or production wastes are sent to PM refining as ***PMs with or without support*** to reclaim the high value.

3. Environmental exposure assessment of refinables

Ed Stutt & Becky Marks

EMPLOYEE OWNERSHIP

QMS ISO 9001 REGISTERED

QMS ISO 14001 REGISTERED

Content

- Collection of monitoring data for revised list of driving constituents
  - Rationale for driving constituents
  - Update of data for previously considered constituents
  - Data for additional constituents, i.e. Se, Te, Co, Sn & PGMs
- Data requirements and exposure assessment going forward

Refinables
Environmental Exposure Assessment

- Environmental exposure assessed on the basis of individual constituents posing greatest risk
  - ‘Driving constituents’
  - Objective of deriving a GES to cover processing of all refinables

- Assessed each constituent separately with holding statement on future intention to consider mixture toxicity
  - » We will follow approach for assessment of combined toxicity of inorganic UVCB mixtures being developed by Eurometaux

Selection of Driving Constituents

- Driving constituents for environmental exposure assessment are those classified as hazardous to the environment (with available PNEC and monitoring data)

- Ag, As, Cd, Cu, Ni, Pb & Zn considered in 2014 registration upgrades
- Se, Te, Co, Sn & PGMs (Pd, Pt, Rh & Ru) were added based on criteria for selection of driving constituents

Environmental Exposure Questionnaire

- Recent environmental exposure questionnaire
  - Tonnages (→ update with recent values)
  - Most recent emissions data (waste water and air) for the full list of driving constituents

➢ Ag, As, Cd, Co, Cu, Ni, Pb, Pd, Pt, Rh, Ru, Se, Sn, Te & Zn

- Asked for provision of <u>all</u> available emissions data on the driving constituents present in refinables at each site (*with additional monitoring or analysis if necessary)

Environmental Exposure Questionnaire Responses

Refinables Driving Constituent	Questionnaires (sites)	Emissions to water (sites)	Emissions to air (sites)
Ag	11	8	6
As	10	8	7
Cd	9	7	7
Co	5	2	2
Cu	11	8	7
Ni	10	8	7
Pb	10	8	8
Pd	5	3	2
Pt	5	3	2
Rh	5	3	2
Ru	5	3	2
Se	5	2	4
Sn	5	2	2
Te	5	2	2
Zn	9	8	6

Refinables
Environment Exposure Assessment

- Additional data required:
  - Priority is emissions data for the additional constituents
  - Also important to update exposure data for previously considered driving constituents

- Exposure data welcomed from all companies, even if they haven't provided any previously

➢ Objective is generation of exposure scenarios to represent <u>whole sector</u>

Environmental Exposure Assessment – Next Steps

- Collection of additional data (many thanks to those sites that have already returned questionnaires)
  - additional monitoring or analysis appears necessary
- Ensure access to exposure modelling parameter values for all additional driving constituents (extended MMD?)
- Generation of revised GES (for all refinables) based on full set of 15 driving constituents
- Updated site specific risk assessments (SSRAs)


wca

4. Update on activities Eurométaux related to inorganic UVCBs

DANIEL VETTER

Cf. separate slideset

5. Workplan and budget

KATRIEN ARIJS

2016 workplan

Dossier maintenance

1. Scoping: ECHA advocacy
2. Substance identification: speciation testing **if needed**
3. Effects assessment and classification: validation testing **if needed** (costs will not be invoiced but taken from reserves)
4. Exposure and risk assessment: MvE assessment, reducing uncertainties in exposure & risk assessment
5. Compilation of IUCLID 5 file & Registration Dossiers: dossier updates to be submitted in 2016
6. IUCLID 5 Hosting System

2016 draft budget

2.	**EXPENSES**	**PMC 2016 Budget**	**PMC 2016 HR**
2.7	***Refinables-specific costs***	***415.000 €***	***0,28***
2.7.1	**Refinables REACH registration**	***0 €***	
2.7.2	**Refinables REACH dossier maintenance**	**415.000 €**	**0,28**
2.7.2.1	*Phase 1: Scoping*	5.000 €	0,03
2.7.2.2	*Phase 2: Substance identification*	70.000 €	0,03
2.7.2.3	*Phase 3: Effects assessment and classification*	235.000 €	0,05
2.7.2.4	*Phase 4: Exposure and risk assessment*	70.000 €	0,05
2.7.2.5	*Phase 5: Compilation of IUCLID 5 file & Registration Dossiers*	30.000 €	0,09
	IUCLID 5 Hosting System	5.000 €	0,00
2.7.2.6	*Phase 6: Admin/other (project mgmt, mtg organisation/participation, communication)*	0 €	0,03
2.7.3	**Refinables REACH evaluation *(not applicable)***	**0 €**	**0,00**
2.7.4	**Refinables REACH classification & labelling**	**0 €**	**0,00**
2.7.5	**Refinables REACH authorisation *(not applicable)***	**0 €**	**0,00**

-> 235.000 € to be taken from reserves

6. AOB, next meetings/calls and closing remarks

6.1 ECHA CMR review

ECHA 2014 CMR report :

- Looks at CMR substances with CLH and monitors to what extent legally binding classification is followed both by notifiers to the C&L Inventory and REACH registrants
  ➔ Vast majority of notifiers & registrants have classified CMR substances in line with legally binding CLH. ECHA will bring notifications not adhering to the CLH to the attention of MS to initiate further action.
- Also looks at all substances notified and/or registered as CMR substances, but that do not have a CLH yet, or a classification more stringent than the harmonised one.
  ➔ Identification of > 1.000 CMR substances that potentially merit further regulatory action (CLH, identification as SVHC). ECHA, together with MSCA is now prioritising such substances for appropriate risk management actions.
- Among the list of 5.675 CMR substances, there are several PM Ref:
  - classified as CMR substances due to their Ni and Pb content
  - for some Ref we have more stringent classification than the harmonised Ni/Pb classification because we used the self-classification that was in MeClas*.
  - Since the Refinables are only used as intermediates, we believe that they will not be prioritised for CLH and identification as SVHC.

** in the future, MeClas will provide the two classifications as output: the harmonised one and the more stringent self-classification. It is then up to the user to include the appropriate classifications in the SDS*

6.2 Authorisation & recycling

- Update from F. Capon on Eurométaux project

Closing

- AOB?
- Next call:
  - Aim: review/finalise internal document Refinables SID approach
  - June
- Next WG meeting:
  - 13, 14 or 15 October