Precious Metals Consortium

PGM TE/WG Meeting – draft minutes

Brussels, 22 March 2017 (11h-16h)

Actions	Who?	When?	Status
Organize a TE call 31 March 2017 on OECD422 Karstedt Conc & share the full draft report	PMC	w/e 24 March	Done
Agree on toxic thresholds and potential C&L of KC	Tox Experts	31 March	
Initiate derivation of KC DNELs afterwards	PMC & Bibra	ASAP after agreement TE	
Update slide 33 and stress the conclusions are tentative	PMC	Before circulating slides	Done
Communicate quickly with Reconsile and SIEF after KC C&L is agreed within PMC	PMC	ASAP after agreement TE	
Update slide 34 and highlight these are potential consequences if classification as CMR cat1.	PMC	Before circulating slides	Done
Compare OECD422 of KC with OECD422 of ligand, and verify if observations might be related to the organic ligand;	PMC & consultants	Before TE meeting 31 March	Study forwarded to Mark Raffray
Investigate fate/presence of KC in articles, and cooperate with Reconsile when drafting exposure scenarios (to be initiated ASAP);	PMC & Reconsile	ASAP	
Liaise directly with chemical companies (eg DOW Chemicals) on CMR properties of siloxanes.	Companies	Before TE meeting 31 March	
Provide input on similarities of required ES with other PGM dossiers	HHPA/2AE registrants	ASAP	

Develop occupational ES for HHPA/2AE once the DNELs are available.	PMC	Summer 2017	
Prepare overview of proposed changes for members (update AnnexIII to VII)	PMC	ASAP after having received Eurometaux' feedback from the Caracal meeting	
Prepare an impact assessment of update Annex III to VII on the REACH dossiers	PMC	During GA in June	
IPA request: inform Mgt Cttee about PGM WG/TE recommendation	France	w/e 24 March	Done
Forward final Pt genetox review by Prof Kirkland to TE	PMC	ASAP	
Organize PhysChem testing for Rh sulphate and Rh tris(2-ethylhexanoate)	PMC	ASAP	Ongoing
Circulate Rh metal draft dossier to WG for review	PMC	ASAP	
Circulate draft AnnexIII justification reports to WG for review after updating the mutagenicity sections.	PMC	ASAP	
Organize bioelution testing Rh(III) cmpds	PMC	ASAP	Quotes being requested
Revise grouping and testing/registration strategy Rh(III) dossiers	PGM TE	After bioelution test data are available	
Prepare Rh(III) registration dossiers without TP for in vivo mutagenicity, update the mutagenicity sections where relevant.	PMC and Bibra	<15 April	
Finalise occupational risk assessment Rh nitrito cmpd and circulate to the WG for review	PMC and Bibra	ASAP	Ongoing
Check the need to include WP02 for Rh nitrito cmpd	Registrants Rh nitrito cmds	ASAP	

Organize PhysChem testing for Ru trihydroxide	PMC	ASAP	Ongoing
Review and agree on RuCl3 mammalian tox assays	PGM TE	As soon as full draft report is available	
Review and agree on TetradoRu mammalian tox assay	PGM TE	As soon as full draft report is available	
Reserves: inform the Mgt Cttee on the WG opinion	France	ASAP	Ongoing

1 Welcome and Introduction

1.1 Reminder on Confidentiality and Competition Law

Participants were reminded on their obligation to comply with Confidentiality and Competition Law.

1.2 Tour de table and apologies

The list of participants is available in Annex 1.

1.3 Approval of the agenda

No remarks were made. The agenda was approved.

1.4 Approval of the minutes of the last meeting (4 October 2016) and status of action points

No remarks were made. The minutes of the previous meeting of 4 October 2016 were approved. All action points identified during previous meeting have appropriately been addressed.

2 Palladium and compounds

2.1 Status (ongoing) registration dossiers

An update was given on the registration status of the Pd dossiers. The four Pd dossiers that were taken out of the Pd batch due to phys-chem data gaps have been finalised and approved by the PMG members (after having sent individual reminders to non-responsive companies). The dossiers will soon be send to the lead registrants for registration by 30 March 2017.

The dossiers of dihydrogen tetrachloropalladate and tetraamminepalladium dihydroxide were not accepted by ECHA following the standard ECHA Manual Completeness Check (MCC) during dossier submission. New phys-chem testing for these substances has been organized (deadline for re-submission is 1 June 2017).

For UVCB registration dossiers, PMC secretariat includes a generic wording in IUCLID section 1.2 (new IUCLID 6 requirement, checked during ECHA MCC). Registrants are advised to check this generic wording and complement with company specific information where possible. PMC secretariat has also shared its experience and concerns about the MCC with the ECHA staff during a meeting (short deadlines for updating dossier, absence of communication). ECHA recognized our concerns and is open for follow-up if issues with testing or update of registration dossiers appear. This communication will go via France. One example is the requested testing for water solubility of aqueous solutions.

The members agree with the classification of Palladium dinitrate as Oxidising solid, Packaging Group I.

2.2 Learning lessons

The Management Committee approved the creation of a PMC Knowledge Management System (KMS). This will also include the OFI (Opportunities For Improvement)-tracker. This tracker contains all weaknesses and points of improvement identified during the dossier preparation phase, and is kept up

to date by PMC secretariat. Via the KMS, PMC members will have access to all relevant PMC studies and documents, incl. the OFI tracker. The OFI tracker will be considered to draft PMC future work plans.

A new dossier approval process has been approved by the Mgt Cttee, and is now under approval of the Sub-Assembly. According to this process:

-focus would be on co-registrants at Work Group and Sub Assembly Level, and dossiers are considered approved when a qualified majority approves. The process remains 2 or 3 weeks.

-at Mgt Cttee level, the approval process remains unchanged.

If approved, the new process will be in place for the SA approval phase for the Pt registration dossiers.

3 Platinum and compounds

3.1 Status (ongoing) registration dossiers

All Pt dossiers that were not registered already (excluding HHPA/2AE and diammineplatinum nitrite with internal registration timing 31 December 2017) have been approved by the Mgt Cttee. Once the new approval process is approved, the dossiers will be sent to the SA. Internal timing for registration of these Pt dossiers by the Lead Registrant is 30 April 2017, except the tetra- and hexachloroplatinate dossiers (Q4 2017 to avoid inclusion in ECHA screening (expected in October 2017)).

Diammineplatinum dinitrite needs registration in the 1-10 tpa tonnage band (was in PMC scope, but originally withdrawn for registration). The timing of dossier preparation and approval will be as for HHPA/2AE (Q4 2017).

The members agree with:

- the classification of Platinum dinitrate as Oxidising solid, Packaging Group I,
- the removal of environmental classification for Karstedt Concentrate (was previously classified as Aquatic Chronic cat4).

3.2 Karstedt Concentrate: dossier update

The Karstedt Concentrate (KC) dossier has been successfully registered by the Lead Registrant.

A draft report (still lacking some critical information) has been discussed with the Tox Experts. During a TE call (17 March), the participants **tentatively** concluded:

- adverse effects are observed at the high dose animals;
- there is no evidence of specific target organ toxicity at any dose level;
- there is evidence of effects on reproductive performance (eg post-implantation loss) at the mid and high dose, but some data are still lacking to properly interpret the experimental evidence (e.g. LPT historical control data);
- there is no evidence of mutagenic effects of KC;
- there is no evidence of effects of KC on endocrine parameters.

The final draft report (including all data) is expected at the latest 24 March. It was agreed to have another call with the Tox Experts at 31 March 2017 afterwards to discuss the observations, and agree then on critical threshold levels and potential classifications.

ACTION:

- **PMC secretariat to organize a TE call on 31 March 2017, share the full draft report with the group as soon as it gets available.**
- **TE to agree on toxic thresholds and potential C&L.**
- **PMC to initiate derivation of DNELs afterwards.**
- **PMC to update slide 33 and stress the conclusions are tentative.**

Once a decision on classification is taken, communication with the SIEF (including Reconsile) is required to inform and agree on the classification and labelling.

ACTION:

- **PMC secretariat to communicate quickly with Reconsile and the SIEF after KC C&L is agreed within PMC**

If the agreement would be to classify KC as reproductive toxicant, this has consequences for the dossier:

- Exposure scenarios need to be generated (including consumer uses & service life);
- Communication with DU is required, and a decision needs to be taken on support of consumer uses or not;
- If KC gets classified as Repro cat1B, this might initiate the simplified restriction procedure (REACH Art 68(2)) for consumer uses (process typically <2 yrs).

ACTION:

- **PMC to update slide 34 and highlight these are potential consequences if classification as CMR cat1.**

PMC has no access to the full dossier of the organic ligand. There is an NDA in place between Reconsile, PMC and its consultants allowing exchange of information (full access only via LTU). It needs to be checked if the observations in the OECD422 with KC are related to the organic ligand (cfr. CMR as class property of siloxanes), and if KC is present in articles or reacting during use (cfr. potential removal of relevant exposure scenarios). It was agreed that Reconsile's input is required when drafting the exposure scenarios. The KC needs to be updated 'without undue delay'. Tentative internal timing is end 2017.

ACTION:

- **PMC to compare OECD422 of KC with OECD422 of ligand, and verify if observations might be related to the organic ligand;**
- **PMC to investigate fate/presence of KC in articles, and cooperate with Reconsile when drafting exposure scenarios (to be initiated ASAP);**
- **PMC member companies to liaise directly with chemical companies (eg DOW Chemicals) on CMR properties of siloxanes.**

3.3 HHPA/2AE: status and remaining work

The in-life phase of the OECD422 study with HHPA/2AE is completed, and an end-of-study summary is expected end of March. A draft report is expected 7 June 2017.

The RMM/OC for the occupational ES for HHPA/2AE are similar to those of Pd dinitrate. The generic ES will be drafted by PMC, as there are several registrants. Bilateral discussions with BASF will serve as a basis for the ES, but co-registrants are invited to provide input on potential similarities with the ES already drafted (eg HHPA or Pd dinitrate). The occupational exposure estimates might be taken from the Occupational Monitoring Data for the Pt group dossiers. Alternatively, MEASE estimates might be sufficient as well due to the expected high toxic threshold concentrations and DNELs.

ACTION:

- **HHPA/2AE registrants to provide input on similarities of required ES with other PGM dossiers;**
- **PMC to develop occupational ES once the DNELs are available.**

3.4 Remaining challenges

In the Caracal Meeting of 22 March, there will be a discussion on the plans to oblige REACH registrants to update dossiers, registered as Annex III exemptions, as full Annex VII dossiers, or even as 'AnnexVII++' dossiers including some data requirements of Annex VIII (eg aquatic toxicity to fish, more in vitro mutagenicity assays, repeated dose toxicity test with screening for reprotox/developmental toxicity (such as OECD422), CSR including exposure scenarios). Underlying reasoning is that the benefits for the community (better identification of toxic substances) outweigh the costs for industry. No decision has been taken on this yet, but the changes are not expected before the 2018 registration deadline. This might have a huge impact on the PMC REACH dossiers (>30 registrations as Annex III also affecting eg. Ir and Re dossiers), although read-across might be applied to minimize additional testing.

ACTION:

- **PMC to prepare overview of proposed changes for members, after having received Eurometaux' feedback from the Caracal meeting;**
- **PMC to prepare an impact assessment on the REACH dossiers by the June GA meeting.**

3.5 IPA STF: in vivo mutagenicity testing with Pt (cmpds)

IPA submitted a request to the Mgt Ctte (15 March 2017). IPA would like to run in vivo mutagenicity tests on various Pt substances to clarify the mutagenicity potential of this group of substances (cfr mutagenic potential suggested in various in vitro assays). IPA doesn't want to wait for the REACH process and the submission of a testing proposal as currently foreseen and agreed in the Pt registration dossiers. IPA requests PMC to put the submission of the Pt dossiers on hold, giving time for IPA to run the mutagenicity assays in the US. The dossiers could be submitted after the completion of the study

including the results. The Management Committee requested the Secretariat to assess the risks and benefits related to this proposal and to discuss this during the PGM Work Group meeting.

PMC identified some remaining questions on IPA's proposal, such as:

• How many and what substances are being tested?

• What assay will be used?

• Who will do testing? (cf. data ownership – important for data sharing and potential compliance check)

• Consistency with PMC registration strategy? (e.g. RAAF, tiered testing, defer Pt nitrate TP)

• What is the impact of the existing registration of Pt dioxide dossier (no TP included, in endpoint summary: '*Based on the existing data set, platinum dioxide does not currently meet the criteria for classification as a germ cell mutagen (category 1A or 1B). However, this conclusion should be revisited when the results of the planned in vivo studies are available*.')

A tentative timeline has been drafted, starting from PMC's internal timing to register the Pt dossiers at the latest January 2018, and the assumptions that:

- Testing can start in May at the latest, which leaves only 6 weeks to design the testing, agree on test protocols and samples and find a testing lab available. This was considered very challenging by the WG;
- There is no need to repeat the study or no delay of the reporting which needs at the very latest to be available in October 2017.

An overview of risks vs benefits has been prepared by PMC and discussed during the meeting. In summary:

- if the outcome of the study(ies) is negative, the risks will be limited and could be managed, but
- if the study(ies) is positive, the risks are higher for the registration of Pt and Pt compounds since we will be obliged to include the study in the registration dossier and update the CSR.

Due to the unpredictability of the outcome of the study(ies), the risks for the registration of Pt and Pt compounds are high. Therefore, based on current understanding of the proposal and the assessment of the impact on Pt registration dossiers, the risks outweigh the benefits. A proposal has been made by PMC Secretariat to the PGM TE/WG, which has been discussed during the meeting:

- BASF challenged the fact that an in vivo MN/Comet assay will be less expensive than a TGR assay based on their experience (some pre-testing needs increase the costs of the MN/Comet Assay). BASF will share with the WG more information on this issue.
- Umicore summarized the discussions in two questions:
    - Can IPA frame this testing into legal obligations? This has to be addressed by IPA and not PMC.
    - Can the testing be done in a so short time frame?

  Based on this, Umicore does not see a risk to pursue with our registration timing and keeping the testing proposal in the registration dossiers. It is worth to note that ECHA

takes also some time before having the testing proposal reviewed and we can always withdraw the testing proposal at any time of the process.

- Johnson Matthey raised the following question: how long can companies live with the risk to have uncertainty related to the mutagenicity classification of the Pt group substances? Companies are comfortable to live within the uncertainties for a short period of time, but not perhaps until the testing proposals are approved and testing performed.

The PGM WG/TE agrees with the PMC Secretariat proposal, and recommends to the Mgt Ctte:

- To keep PMC internal timing unchanged and keep the TP in the registration dossiers;
- To leave IPA to make their own decisions and developing their workplan regarding additional testing but ensuring that the decisions taken are not hampering the PMC workplan/deadlines;
- Evaluate the need to update the PMC dossiers when new data will be available.

ACTION:

- **PMC to inform Mgt Cttee about PGM WG/TE recommendation**
- **PMC to forward final Pt genetox review by Prof Kirkland to TE.**

4 Rhodium and compounds

4.1 Dossiers status

An update was given on the registration / preparation status and timing of the Rh dossiers.

Rhodium sulphate will be registered as solution (solid can not be isolated), and Rhodium tris(2-ethylhexanoate) as solid (and not as solution). As a consequence, there are datagaps for some phys-chem endpoint in both dossiers. The issue has been discussed with the Lead Registrant, and additional testing will be organized ASAP in order to fill all endpoints. As a consequence, both substances will be taken out of the internal Rh registration timing (Q2 2017) and registered later (timing to be confirmed). The additional testing is required to anticipate maximally non-acceptance during ECHA's MCC.

The AnnexIII justifications have been drafted by the consultants, and will be circulated after they have been updated for mutagenicity (cfr. discussion under agenda point 4.2). The participants agree with the proposal to update the Rh2O3 dossier (currently AnnexIII) to an Annex VII dossiers ASAP after registration (cfr strategy for PtO2 dossier).

The Rh metal draft dossier is available, and will be circulated shortly to the WG for review.

ACTION:

- **PMC to organize PhysChem testing for Rh sulphate and Rh tris(2-ethylhexanoate) ASAP**
- **PMC to circulate Rh metal draft dossier to WG for review**
- **PMC to circulate draft AnnexIII justification reports to WG for review after updating the mutagenicity sections.**

4.2 Rh(III) genetox review

A discussion was held on the Rh(III) genetox review and proposed actions. The review document has been prepared by PMC Secretariat, and includes all relevant publications/studies it is aware of. The document has been reviewed by Mark Raffray and David Boyd.

The participants agree that:

- the Rh nitrito compounds is expected to be not stable at acidic pH (only stable complex at neutral pH), supporting the precautionary classification as Muta2 despite a solid negative in vitro mutagenicity testing.
- Rh2O3 is expected to dissolve poorly in acidic environment, but experimental verification is required.
- DMSO is able to (partly) dissolve RhI3 at neutral pH and form Rh(III) ionic complexes, with Rh(III)-DMSO complexes being potentially highly reactive. This supports the hypothesis that the positive outcome of the Ames assay with RhI3 is a false positive, and should be included as such in the REACH dossier. A new test should not be initiated till the bioelution testing data are available (cfr further).
- The preliminary Ames test with Rh2O3 suggest a similar negative outcome than Rh(OH)3, but the participants don't support finalization of the full test until the results of the bioelution testing is available (cfr further)
- The poorly water soluble Rh(III) compounds and Rh metal should remain without mutagenicity classification without additional experimental evidence. This is supported by the negative Ames test for Rh(OH)3.
- Bioelution testing needs to be organised as first tier test in order to better (re)group Rh(III) substances. Speciation analysis is considered difficult and not required at this stage – only the determination of Rh concentrations in solution is sufficient. Soluble Rh is expected to be in 3+ oxidation state. At least three testing labs need to be contacted for offers (Umicore, ECTX, Fraunhofer). Artificial gastric juice is the only test solution required, and RhCl3 (as water soluble cmpd), the Rh nitrito compound (moderately water soluble cmpd) and Rh trihydroxide, trioxide and triiodide (as poorly water soluble cmpds) will be tested. Once the data are available, the TE will discuss and decide on the further steps for these dossiers (eg perform/finalise AMES testing Rh2O3 and RhI3? Include TP for in vivo mutagenicity for poorly water soluble Rh(III) cmpds?)
- No testing proposal will be included in the REACH dossiers for the water soluble and moderately water soluble Rh(III) compounds. There is a positive in vivo MN assay with RuCl3 available, and this test is expected to drive potential regulatory assessments, despite its shortcomings (cfr ip administration, not according today's standards). A classification as Muta2 is considered sufficiently protective based on today's knowledge.

The bioelution test data will not be available before the Rh registration deadline. The grouping (and thus potentially also registration dossiers/strategy) will be revised after test data get available. It is

considered safe to submit the dossiers (including poorly water soluble Rh(III) compounds) without TP based on today's scientific knowledge, and keep the (non-)classifications unchanged.

ACTION:

- **PMC to organize bioelution testing (request quotes from at least 3 labs)**
- **PMC TE to revise grouping and testing/registration strategy after bioelution test data are available**
- **PMC to prepare registration dossiers without TP for in vivo mutagenicity, and update the mutagenicity sections (in IUCLID and AnnexIII justification documents) as discussed above.**

4.3 Diammonium sodium hexakis(nitrito-N) rhodate: status and remaining work

All ENV and HH testing with this compound has been finalised.

PNECs have been derived, considering ecotox data for all Rh(III) compounds (cfr strategy for Pt dossiers). The environmental risk assessment strategy is comparable to the one for the Pd and Pt dossiers, and all uses are shown to be safe.

The Rh nitrito compounds is classified as Muta cat2. A qualitative occupational risk assessment is currently being done, with a 'high hazard' banding. DNELs have been derived (using the substance specific OECD422 study – worker,systemic,long-term 47 mg/m³ (inhalation) and 133 mg/kg/d (dermal)) and used as supportive evidence for safe use in the qualitative assessment. Exposure monitoring data are available from the 2016 PMC occupational monitoring project, and are used for the assessment. Methodology and principles (qualitative assessment) are based on the hexachloroplatinate dossiers. Registrants are requested to inform if WP02 'sampling/evaluation' is required for the assessment (cfr slides for other workplaces).

The participants agree with the classifications of

- Diammonium sodium hexakis(nitrito-N) rhodate as Aquatic Chronic 2
- Rhodium trichloride as Aquatic Acute 1, Chronic 1 (M-factor 1).

ACTION:

- **PMC to finalise occupational risk assessment and circulate to the WG for review**
- **Registrants are requested to check the need to include WP02.**

4.4 Some bottlenecks

The participants are reminded that the lack of input on SID cards, PC data/sample request and changes of tonnages (for substances that are within PMCs 2015 scope!) are bottlenecks for a timely finalization of the REACH dossiers.

4.3 Remaining challenges

The participants were informed on the main challenges for the Rh dossiers.

5 Ruthenium and compounds

5.1 Dossier status

An update was given on the registration / preparation status and timing of the Rh dossiers.

Ruthenium trihydroxide will be registered as solid (on the market as suspension). As a consequence, there are datagaps for some phys-chem endpoint in both dossiers. The issue has been discussed with the Lead Registrant, and additional testing will be organized ASAP in order to fill all endpoints. As a consequence, the substance might be taken out of the Ru registration timing (Q3 2017) and registered later (timing to be confirmed). The additional testing is required to anticipate maximally non-acceptance during ECHA's MCC.

ACTION:

- **PMC to organize PhysChem testing for Ru trihydroxide ASAP.**

5.2 RuCl3: status and remaining work

All ENV and HH testing with this compound has been finalised.

PNECs have been derived, considering ecotox data for all Rh(III) compounds (cfr strategy for Pt dossiers). For this compound, only data for RuCl3 have been identified. The environmental risk assessment strategy is comparable to the one for the Pd and Pt dossiers. A preliminary assessments suggests that all uses will be safe.

The in-life phases of the OECD407 and 421 assays are terminated, and draft reports are available for both assays. The results have been discussed by the TE, and there is no evidence of target organ toxicity or effects on reproductive ability, fertility or lactation and development identified. The substance does not require an additional classification.

ACTION:

- **PMC TE to review and agree on outcome RuCl3 mammalian tox assays.**

5.3 TetradoRu: status and remaining work

All ENV and HH testing with this compound has been finalised.

PNECs have been derived, considering ecotox data for all Ru(IV) compounds (cfr strategy for Pt dossiers). For this compound, only data for TetradoRu have been identified. The environmental risk assessment strategy is comparable to the one for the Pd and Pt dossiers. A preliminary assessments suggests that all uses will be safe.

The in-life phase of the OECD422 assay is terminated, and a draft report is just made. From the report conclusions (only draft version!), no additional classification/labelling is expected. The report needs however a review and discussion by the TE before conclusions can be made.

The participants agree with the classifications of

- RuCl3 hydrate as Aquatic Acute 1, Chronic 1 (M-factor 1)
- TetradoRu as Aquatic Acute 1, Chronic 1 (M-factor 1).

ACTION:

- **PMC TE to review and agree on outcome TetradoRu mammalian tox assay.**

5.4 Remaining challenges

The participants were informed on the main challenges for the Ru dossiers.

6 Budget and workplan

The members approved the proposed budget for 2018. PMC secretariat clarified that the budgets might significantly change depending on the timing and need (or not) to update AnnexIII exempted REACH dossiers to Annex VII dossiers (cfr discussion under point 3.4).

For some PGMs, reserves are higher than anticipated. This is mainly due to changes in portfolios, new members and the selling of LoAs. The reserves have been reviewed by the Mgt Cttee. The Mgt Ctte is cautious to decide on the reserves now, due to the identified uncertainties in many dossiers (cfr. table prepared by PMC Secretariat – slide 133), but asks the WG meeting participants' opinion on the reserves:

- Wait till after the registration deadline to decide on the reserves (eg payment holidays), or
- Decide now that reserves are too high and that the excess should be used directly to lower membership fees.

The meeting participant agreed to keep the reserves as is, and decide later when having a better view on the many challenges for the PGM dossiers and anticipated workload. There is an agreement to not change the invoicing now.

ACTION:

- **PMC secretariat to inform the Mgt Cttee on the WG opinion.**

7 AOB, next meetings/calls and closing remarks

The AoA project is delayed due to delayed company input. It was however preferred to have a high quality report, even if this causes a delay in reporting.

A summary was given of the 2016 PGM Occupational Monitoring Project. The project was successful in gathering monitoring data for Pd, Ru and Rh. Participants were thanked for their contributions.

The chairman thanked the participants of the meeting, and PMC secretariat for the preparatory work.

Next PGM TE&WG meeting is scheduled 18 October 2017 (full day).

Annexes:

1. Agenda & List of participants
2. Slides presented at the meeting

Annex I: Agenda & List of participants

Maxime ELIAT, consultant for EPMF (Arche, Belgium)

Jelle MERTENS, EPMF (Belgium)

France Capon, EPMF (Belgium)

Bodo BERKNER, Ferro (Germany)

Roland BRASCH, Heraeus (Germany)

Arno BUTHE, Heraeus (Germany)

Sylvia FEHSE, Saxonia (Germany) – via conference call

Herbert FUCHS, Heraeus (Germany)

Mark HOSFORD, Johnson Matthey (United Kingdom) – via conference call

Michael HUBER, C. Hafner (Germany)

Mari JÄRVIKIVI, Norilsk Nickel (Finland) – via conference call

Marie-Laure LEDRICH, Consultant for Traxys (Luxembourg) – via conference call

Olga LEMKE, BASF (Germany)

Manfred PROBST, C. Hafner (Germany)

Nissanka RAJAPAKSE, Johnson Matthey (United Kingdom)

Mike SHEPHERD, Vale (United Kingdom)

Marc SIMON, Traxys Europe (Luxembourg) – via conference call

Hege STUBBERUD, Glencore (Norway)

Eric TEUBEL, Saxonia Edelmetalle (Germany) – via conference call

Michael THIEL, BASF (Germany)

Steven VERBERCKMOES, Umicore (Belgium)

Carole WILSON, Vale (United Kingdom) – via conference call

Annex II: Slides presented at the meeting

To be included