Hydromet videomøte 10.02.2015

		Referat fra prosjektmøte nr 1- 2015				
			Present	Absent	Informing	Agreement
		Sent to: Jens-Petter Andreassen, NTNU	☒	☐	☐	☐
		Ana Maria Martinez, SINTEF	☒	☐	☐	☐
		Egil Skybakmoen, SINTEF	☐	☐	☒	☐
		Liv Stavsetra, IFE	☒	☐	☐	☐
		Tor Bjørnstad, IFE	☐	☐	☒	☐
		Tom Rames Jørgensen, Yara	☒	☐	☐	☐
		Ole Morten Dotterud, Glencore Nikkelverk	☒	☐	☐	☐
		Maria Førde Møll, Boliden Odda	☐	☒	☒	☐
		Steinar Jørstad, Boliden Odda	☐	☐	☒	☐
		Grethe Wibetoe, UiO	☐	☐	☒	☐
		Jon Petter Omtvedt, UiO	☒	☐	☐	☐
		Dag Øistein Eriksen, UiO	☒	☐	☐	☐
		Hans Vigeland Lerum, UiO	☒	☐	☐	☐
		Alexander Krivokapic, IFE	☒	☐	☐	☐
		Dejene Kifle, UiO	☒	☐	☐	☐
Archive code	**Grade** KONFIDENSIELL	Ulf-Rune Visur Syversen, NFR	☐	☐	☐	☐
		Arne Petter Ratvik	☒	☐	☐	☐
Electronic archive code		**Invited by** Jon Petter Omtvedt & Dag Ø. Eriksen	**Recorded by** Hans and Dejene			
Project no.	**Date** 11.02.15	**Place**, SINTEF Materialer og Kjemi	**Meeting dates, hours:** 10.02: 10.00 – 12.00			

2015-1 Introduction of PhD and Post-doc fellows and presentation of their research plans

2015-1a Hans Vigeland Lerum (PhD candidiate)

Hans presented himself and his plan for further experiments. Summary would be to use Liquid-liquid extraction to remove Hg from process solutions. Some methods were suggested: Using Ionic Liquids (IL), using electrode potentials to change the oxidation state of Hg, study the Hg behaviour in a surplus of sulphuric acid and see how Cl^- content would affect the extraction, if this showed promising results the methods could probably also be applicable to the homologues of Hg: Cd and Zn.

The floor was then opened for discussion. Sintef is interested in using IL for extraction and they have plans to further investments in this. They would like to focus on the base metals such as copper, zinc etc. This could prove to be synergetic with extractions of mercury also using IL. This could also make the collaboration between Oslo and Trondheim closer. It was commented that the normal way to remove mercury from a solution was in its elementary state or halogenated.

It is imperative that the speciation of the metals to be extracted is known, as well as their oxidation states and if they form adducts with potential ligands present. The industry partners were willing to provide real industrial solutions to be studied (analysed) in order to answer the latter question. . However it was important to note that the composition of the solutions would change depending on the raw material used in the process. It was also noted by the industry partners that not all results could be published.

It was also agreed by those attended the meeting that Hg was a reasonable (right?) element to study.

2015-1b Dejene Kifle (Post-doc)

Dejene 2ifle presented himself, his experience and what he would plan to work on. Dejene suggested that due to his previous experience the best use of his skills would be to work on recovery of high value metals, such as Platinum Group Metals (PGMs): Ru, Rh, Pd, Os, Ir, Pt, gold (Au) and Rare Earth Elements (REEs). His previous experience with liquid chromatography (HPLC) columns and Solid Phase Extraction (SPE) could be applied to other extractants, such as magnetic resins and/or resins that could be separated from the flow in one or another way.

Glencore works with recovery of PGMs and showed interest in the proposed work plan. Dejene mentioned the problem associated with the presence of iron on individual separation of PGMs and gold based on his previous experience. Dag suggested that extractants such as TBP could be used to remove iron from the hydrochloric acidic feed. Removing the PGMs as a group is a “luxury problem”. Glencore will discuss the PGMs with the rest of the board and give more information back.

2015-2 Future research plans

The future plans should be presented during the seminar in March to be held in Oslo.

2015-3 Removal of unwanted elements

NTNU plans to use methods such as crystallisation to remove unwanted elements. Either the unwanted elements would be pushed out by the crystallisation process, or alternatively they could be trapped by the crystallisation and then be removed together with the crystals. They would like to look into low melting eutectic mixtures such as $Ca(NO_3)_2 \bullet 4(H_2O)$ to see if it is possible to use Ca^{2+} as a scavenger.

2015-4 Acidity of process liquids of the different industries

The expected pH ranges of the process solutions for the different industry partners were discussed.

Tom mentioned Yara finds itself on the lower end of the pH scale ranging from 0.5 - 1. To keep the pH low is due to the high phosphate content, which will precipitate with calcium at higher pH.

Glencore is also on the lower end of the pH scale. Not much leeway available.

Boliden Odda is s also operated at the lower pH around 0. In some of the phases during the production, however, the pH is increased to 7.

If there are some questions regarding the specific process solutions it is possible to call the specific industrial partner.