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KU Leuven – Department of Chemistry

IMCN/iMMC SEMINAR

***« Solvometallurgy: an emerging branch
of extractive metallurgy »***

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Auditorium BARB91**

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ABSTRACT

Solvometallurgy is the extraction of metals from ores, tailings, industrial process residues, production scrap and urban waste using non-aqueous solutions. Solvometallurgy differs from hydrometallurgy by the absence of a discrete water phase. The solvents are either organic or inorganic solvents (excluding water). Sustainable solvometallurgical processes must be based on green solvents. Therefore, toxic or environmentally harmful solvents must be avoided. Most of the unit processes in solvometallurgy are very similar to those in hydrometallurgy, with the main difference being that the water is replaced by a non-aqueous solvent.

Solvometallurgy is complementary to pyrometallurgy and hydrometallurgy. However, this new approach offers several advantages. Firstly, the consumption of water is very limited offering a major advantage in regions where there is a shortage of water. Secondly, the leaching and solvent extraction can be combined in a single step, which leads to simplified process flow sheets. Thirdly, solvent leaching can be more selective than leaching with acidic aqueous solutions, leading to reduced acid consumption and less purification steps. Fourthly, solvometallurgy is useful for the treatment of ores that are rich in soluble silica (such as eudialyte) as no silica gel is formed. Hence, solvometallurgy is in a position to help develop near-zero-waste metallurgical processes, and with levels of energy consumption that are much less than with high-temperature processes.

In this seminar, an overview of the development of solvometallurgy will be given, with emphasis on recent work done at the SOLVOMET group of KU Leuven.

BIOGRAPHY

Prof. Koen Binnemans is an inorganic chemist and has more than 25 years of expertise in the field of rare earths. He is head of the SOLVOMET Group at KU Leuven (Laboratory of Metallurgical Chemistry). His main research lines are: (1) critical metals, with a focus on rare earths; (2) ionic liquids; (3) solvent extraction, and (4) solvometallurgy. Solvometallurgy is the extraction of metals from ores, extractive waste, industrial process residues, production scrap and urban waste using non-aqueous solutions. Solvometallurgy differs from hydrometallurgy by the absence of a discrete water phase. Koen Binnemans has published more than 480 papers in international journals. His work has been cited more than 21,000 times (h-index = 68).



Website research group: <https://chem.kuleuven.be/solvomet>