

Ph.D. defense

Institut de Chimie Séparative de Marcoule / CEA Marcoule
(UMR 5257, CEA, CNRS, Université Montpellier, ENSCM)

BERTRAND BRAIBANT

will present his Ph.D. dissertation

Preparation and studies of fluorinated systems for the liquid/liquid extraction of strategic metals

The defense will take place on **Tuesday, October 10, 2017 at 2.00 pm**
in the ICSM Auditorium

A large part of the metals used by the industry is still coming from mines. Some metals, called strategic metals, may encounter a supply risk or even a total depletion of natural resources. They are usually used in a dispersive way which makes their recovery complicated, costly and energy intensive since they are in unequal amount, with other metal, in ever more complex matrices. Whether for strategic, economic or societal reason, the metal recycling is about to become an important industry in a near future. Hydrometallurgical processes, and liquid-liquid extraction in particular, are a robust technique giving answer to some of the recycling challenge. Our aim was to develop and study some fluorinated system for the extraction and the separation of metal through liquid-liquid approach. The tunability of the fluorinated part of these systems allows the study of multiple interaction (complexation or supramolecular ordering) important in a fundamental point of view in liquid-liquid extraction. Physical and chemical properties such as their miscibility allow the development of new processes in the solvent extraction field such as triphasic liquid extraction system. To this end, two series of fluorinated malonamides with various spacer lengths between the complexing head and the fluorinated moiety were synthesized. The modulation, through the spacer, of the inductive effect of the fluorinated chain on the physical and chemical properties of the extractant and the complexation of the metal was studied. The influence of various extraction parameters such as the concentration in extractant, the acid and the diluent were characterized. The comparison of these malonamides with their hydrogenated homologues was done and the limits of these systems established. A family of trialkylphosphate was developed and applied to a triphasic extraction system. Preliminary results confirm the approach.

Keywords: Liquid/liquid extraction; Fluorinated system; Recycling

