Ph.D. defense

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

CARLOS ARRAMBIDE CRUZ

will present his Ph.D. dissertation

Synthesis methodologies of chelating formo-phenolic resins: towards optimized solid-liquid extraction of strategic metals

The defense will take place on **Tuesday, November 28, 2017** at **2.00 pm**
in the ICSM Auditorium

Extraction of specific targeted species (rare earth, heavy metals, transition metals, radionuclides) from industrial (mining deposit and urban mining) and nuclear effluents is an important issue in the recycling and / or decontamination processes. A large number of organic and inorganic solids, chelating or ion-exchanging materials, have been developed for selective ionic separation by solid / liquid process. Metal-specific ligands incorporate in the structure of the resin itself is an interesting way to perform ion separation taking the advantage of the selectivity of chelating agents. The aims of this project are firstly the synthesis of chelating original systems and then prepare specific ion exchange resins.

From formo-phenolic resins incorporating catechol and 8-hydroxyquinoline, we have been able to show that the selective recovery of germanium from silicon or zinc was possible, depending on their proportion of each phenolic precursor in the polymeric matrix.

The synthesis of the phenolic precursors integrating ligands such as diglycolamic acid and diglycolamides allowed the use of resin for the recovery of rare earths elements. A study on the understanding of the synthesis of resins as well as their performance of extraction was thus realized and was able to highlight the potential of these resins for the recovery and valorization of the rare earths elements.

An opening towards other possibilities of synthesis of this type of resins (porous materials, in the form of foam, etc.) is also proposed in order to increase the contact surfaces during solid-liquid extractions and thus increase the performance of these materials.

Keywords: reactive ligands; formo-phenolic resins; solid / liquid extraction; germanium; rare earths