JULIEN REY

will present his Ph.D. dissertation

Study of synergistic extraction mechanisms in liquid-liquid separation

The defense will take place on **Friday, September 16, 2016** at **10.00 am**

in the ICSM Auditorium

Separation chemistry is a pillar of technologic development in extraction, separation and selective remediation of metals and molecules. It finds its applications in the fields of electronic, renewable energy, medicine and chemistry, which require more than ever the use of “Strategic Metals”. The liquid-liquid extraction is a separation technique that is involved in hydrometallurgical processes for the recovery of strategic metals from primary deposits, secondary and urban mines.

This work is part of global vision of optimization of liquid-liquid extraction processes used in synergy, consisting in understanding the mechanisms underlying the synergy, and generalizing these mechanisms to all synergistic extraction systems. The understanding of these mechanisms underlying synergism aims at predicting and developing new synergistic extractants mixtures.

To better understand the driving forces at the origin of synergistic phenomena, a suitable methodology for the characterization of supramolecular structures of extractant in the organic phase was exploited during this thesis work. The use of techniques like Small Angle Neutron / X-ray Scattering X-ray (SAXS /SANS) and interfacial tensiometry was crucial for the understanding of the synergistic mechanisms. A thermodynamics approach was also proposed to estimate quantitatively the key driving forces involved in the liquid-liquid extraction mechanisms. The application of these keys of comprehension helped to design a new synergistic system for the extraction of rare earths elements from phosphoric medium.

Keywords: Liquid-Liquid; Synergism; Extraction; Microemulsion; Aggregation