REMIE POIROT

will present his Ph.D. dissertation

Extraction of palladium using malonamides: behaviour and specificity compared to the lanthanides

The defense will take place on Monday, December 1, 2014 at 2:00 pm

in the ICSM Auditorium

Recycling of valuable metals appears as a solution of growing interest for a sustainable supply strategy nowadays. Palladium (Pd), along with other platinum group metals (PGM) and rare earth elements (REEs), represents one of the crucial issues in recovery processes. Malonamides are neutral amphiphilic molecules which have proved their potency for the extraction of lanthanides. These extractants in nitric media were thoroughly studied in frame of nuclear fuel treatment towards lanthanide-actinide separation. Within this framework, our purpose was to study liquid/liquid (L/L) extraction towards Pd recovery from nitric media by a malonamide: the DMDOHEMA. Various parameters such as equilibration time, pH, extractant and nitrate concentrations were investigated in detail. In some experimental conditions, a Pd-rich solid third phase appears at the interface. These third phases were deeply analysed with NMR, IR and XPS. Mechanistic studies involved complete analysis of the organic phases, including chemical speciation at the molecular level (coordination chemistry with NMR, IR, XRD), and supramolecular ordering characterization (with SAXS and NMR). Palladium complexes were identified and characterized. Similarities and differences between palladium and lanthanides behaviour during extraction were evidenced and both can be efficiently co-extracted or separated according to different experimental conditions.