

Ph.D. defense

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

DAMIEN RINSANT

will present his Ph.D. dissertation

Development of MOF-type Hybrid Functionalized Materials for Selective Uranium Extraction

The defense will take place on **Wednesday, October 9th, 2019 at 1.30 pm**
in the ICSM Auditorium

The increase of world nuclear energy production requires the research and development of new, more efficient and ecofriendly processes for uranium ores valorization. Therefore, the development of novel materials for an efficient solid-liquid extraction of uranium is necessary. The main objective of this thesis is to evaluate the interest of Metal Organic Framework (MOF) materials for the recovery of uranium from ores by a solid-liquid separation process. MOFs are hybrid and crystalline materials showing high performances for uranium extraction in weak acid solutions.

To meet this objective, the stability of two types of MOFs has been studied at different contact times in acidic solutions simulating the ore leachate. Afterwards, zirconium-based MOFs functionalized with tertiary amines or amidophosphonates have been synthesized and characterized by PXRD, BET, TGA, SEM, FT-IR and NMR. The uranium extraction behavior of three functionalized MOFs has been studied function of contact time, uranium or sulfate concentration and pH. The uranium extraction data obtained, coupled with the spectroscopic analysis of uranium loaded materials, made it possible to advance the understanding of uranium extraction mechanisms for the two functions studied.

Keywords: MOFs, Organic Synthesis, Solid-Liquid Separation, Uranium

