

Ph.D. defense

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

ALVARO SARA VIA

will present his Ph.D. dissertation

Carbide fuel synthesis from nanostructured precursor: impact on the carboreduction and the physicochemical properties

The defense will take place on **Wednesday, September 23, 2015 at 10.00 am**
in the ICSM Auditorium

The synthetic route conventionally used to manufacture carbides fuels involves carboreduction of a mixture of AnO_2 powders and graphite at high temperature ($1600^\circ C$) and under a low vacuum. These conditions are disadvantageous for the synthesis of mixed carbides (U,Pu)C due to volatilization of plutonium. This is why one of the main goals of this work was to reduce the temperature of carboreduction. Our work was mainly carried on the lowering of the temperature of carboreduction of uranium oxide. This result was achieved by increasing the reaction surface between the carbon and uranium oxide. To do these colloidal suspensions of uranium oxide nanoparticles were prepared and stabilized with cellulose ethers. Cellulose ethers serve both as a stabilizer for the uranium oxide nanoparticles, but also as a carbon source for the carboreduction. These precursors have shown to be more efficient for the carboreduction compared to the standard precursors: a reduction of $300^\circ C$ on the carboreduction temperature was obtained under low vacuum. The impact of this type of precursors on the carboreduction and physicochemical properties and the structural and microstructural characterization of obtained carbide were performed.

