

Exploring PuO₂ colloidal nanoparticles at the MARS beamline : synchrotron radiation as a tool to unravel their structure, reactivity, and formation mechanisms

Matthieu VIROT

(ICSM, Univ Montpellier, CEA, CNRS, ENSCM, Marcoule)

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Amphithéâtre SOLEIL

Plutonium is an anthropogenic and highly radioactive element primarily produced in nuclear reactors. In aqueous solution, it exhibits complex chemistry driven by redox transformations, complexation, disproportionation, and hydrolysis reactions.^{1,2} In particular, the hydrolysis of Pu(IV) leads to the formation of stable “intrinsic” colloidal suspensions, even under strongly acidic conditions. Although first observed during the Manhattan Project, these species have remained relatively understudied compared to other aqueous Pu forms. However, renewed interest has emerged due to concerns about the environmental migration of radioactive materials and the development of advanced nuclear fuels, highlighting the need for a more comprehensive understanding of Pu(IV) colloids.²⁻⁴ This presentation will showcase recent advances made by our team, and underpinned by both laboratory studies and synchrotron radiation, in the multi-scale structural characterization of colloidal PuO₂ nanoparticles, along with investigations into their reactivity and formation mechanisms.



Ce séminaire sera suivi d'une pause café

Formalités d'entrée : accès libre dans l'amphi du pavillon d'Accueil.

Si la manifestation a lieu dans le Grand Amphi SOLEIL du Bâtiment Central merci de vous munir d'une pièce d'identité (à échanger à l'accueil contre un badge d'accès).

SYNCHROTRON SOLEIL

Route départementale 128 - 91190 SAINT AUBIN

<https://www.synchrotron-soleil.fr/fr/evenements>

CONTACT : sandrine.vasseur@synchrotron-soleil.fr

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