Institut de Minéralogie et de Physique des Milieux Condensés
Unité Mixte de Recherche 7590
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SÉMINAIRE
Lundi 24 juin, 10h30

Salle de conférence, 4ème étage, Tour 23, couloir 23-22
IMPMC, Université P. et M. Curie, 4, Place Jussieu, 75005 Paris

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ENVIRONMENTAL SPECIATION OF ACTINIDES

Although minor in abundance, light actinides (Th, Pa, U, Np, Pu, Am, and Cm) are important environmental contaminants associated with anthropogenic activities. We discuss the abundance, production, and environmental sources of naturally occurring and some man-made light actinides. We review the aqueous speciation of U, Np, and Pu as a function of pH and Eh, their interaction with common inorganic and organic ligands in natural waters, and some of the common U-containing minerals. We also discuss the interaction of U, Np, Pu, and Am solution complexes with common Earth materials. Surface interactions can inhibit or enhance (e.g., colloid-facilitated transport) the dispersal of light actinides in the biosphere and in some cases (e.g., interaction with dissimilatory metal-reducing bacteria, NOM, or Mn- and Fe-containing minerals) can modify the oxidation states and, consequently, the behavior of redox-sensitive light actinides (U, Np, and Pu). Finally, we review the speciation of U and Pu, their chemical transformations, and cleanup histories at several U.S. Department of Energy field sites that have been used to mill U ores, produce fissile materials for reactors and weapons, and store high-level nuclear waste from both civilian and defense operations.

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