

Nuclear energy and radiochemistry

Foreword

The chemistry of actinides and lanthanides has drawn increasing interest as this research direction is linked to the renewal of processes implying complex fluids and hybrid materials used for selective separation of metals, environmental remediation, sustainable development, and public health issues. Whatever the technology chosen, the optimized use of all uranium isotopes and the implementation of processes for actinides–lanthanides extraction and storage are major goals.

These research programs cover several subdomains of chemistry, including physical chemistry of colloidal fluids, surface chemistry of solids, and solid-state chemistry of nanomaterials.

This thematic issue, divided into five sections, is devoted to the following topics:

- **coordination chemistry of actinides and lanthanides** (structural characterization in solution by EXAFS, XANES...; spectroscopic characterization by absorption, emission, NMR... spectroscopies; molecular modelling, quantum chemistry and structural aspects; synthesis of new actinide and lanthanide-based organometallic complexes);
- **physicochemical study of actinides and lanthanides in solution** (thermodynamic aspects of actinide complexation [stability constants, redox potentials, solubility products...]; critical evaluation of thermodynamic data in relation to databases);
- **selective extracting agents and actinide–lanthanide separation** (modelling of solute–solute and solute–solvent interactions, selective extracting agents and processes [liquid–liquid, solid–liquid, membranes...]; in vivo decorporation);
- **radioelements in the environment** (characterization of interfacial and migration phenomena, radionuclides–microorganisms' interactions);
- **actinides and lanthanides in unconventional media** (ionic liquids, molten salts).

Roger Guilard

Institut de chimie moléculaire,
Université de Bourgogne,
9, avenue Alain-Savary,
BP 47870,
21078 Dijon cedex, France

E-mail address: roger.guilard@u-bourgogne.fr

Available online 23 August 2007