

Title:

**Thermodynamic approach to evaluating complexants
for their ability to decontaminate and mobilize radionuclides**

1. Profile Information of Rai, Dhanpat

略 歴

1963 B.Sc. Agriculture (Chemistry Major), Panjab Agricultural University, India
1965 M.Sc. Soil Science, Panjab Agricultural University, India
1970 Ph.D. Soil Science (Chemistry-Mineralogy), Oregon State University
1970-1971 Post-Doctoral Fellow, Oregon State University
1971-1973 Post-Doctoral Fellow, Colorado State University
1974-1975 Research Associate/Assistant Professor, New Mexico State University

1975-1981 Senior Research Scientist, Pacific Northwest National Laboratory
1981-1990 Staff Scientist, Pacific Northwest National Laboratory
1990-2002 Senior Staff Scientist, Pacific Northwest National Laboratory
2002-2007 Laboratory Fellow, Pacific Northwest National Laboratory

2007- 現在 Technical Director, Rai Enviro-Chem

主な業績

OECD/NEA 熱力学データベースプロジェクト

データ選定委員（共著者）：Th（2008）

ピアレビューワー：Np および Pu(2000), U, Am, Np, Pu および Tc のデータ更新
(2003)

米国 West Isolation Pilot Plant アクチニド溶解度評価プロジェクト

プロジェクトマネージャー

「地層処分研究開発第2次取りまとめ」用 熱力学データベース開発
テクニカルアドバイザー兼レビューワー

著書, 論文 等

230 本以上もの査読付論文

“Chemical Thermodynamics of Thorium”, NEA in OECD (2008) (共著) .

2. Outline of colloquium

This presentation will describe a general approach for developing and evaluating fundamental data for a selected complexant so that its usefulness in decontamination activities or its influence on potential mobilization of radionuclides from nuclear wastes can be determined. It is generally understood that the complexant's ability to decontaminate and mobilize radionuclides depends on several factors including pH, concentration of the complexant, and the complexation constant with the metal ion of interest. However, what generally is not taken into consideration in these evaluations is that the complexant may strongly interact with competing metal ions that are invariably present in geomedias along with the radionuclides of interest. If the competing metal ion complexes in the environmental range of interest are stronger than the radionuclide of interest, then these interactions can reduce the effective concentration of the complexant and thereby reduce the effectiveness of the complexant to decontaminate and mobilize radionuclides. Using ethylenediaminetetraacetic acid (EDTA) and isosaccharinic acid (ISA) as examples of complexants for use with actinides, the presentation discusses 1) the experimental approach taken to obtain reliable thermodynamic data for actinides as well as competing metal ions (e.g., Fe(III) and Ca), and 2) the use of these fundamental data in determining the applicability of EDTA and ISA for decontamination of actinides or their impact on actinide mobility in geomedias.