

# **MIGRATION 2005**

**Avignon, France,  
September 18-23, 2005**



## **Programme**

**Sunday, 18. September, 2005**

12:00 Registration  
16:00 Opening session  
16:40 Plenary introductory session  
17:50 Private visit of the Palais des Papes  
19:00 Reception

**Monday, 19. September, 2005**

8:15 – 9:15 Introduction  
9:15 – 10:30 *Session 1*  
Solid solution and secondary phase transformation  
10:50 – 12:30 *Session 2*  
Migration behavior of radionuclides  
14:00 – 15:35 *Session 3*  
Geochemical and transport modelling  
16:20 – 18:00 *Session 4*  
Redox reactions and radiolysis  
19:00 – 22:00 *Session 5*  
Poster session 1

**Tuesday, 20. September, 2005**

8:30 – 10:55 *Session 6*  
Innovative experimental methods  
11:15 – 12:30 *Session 7*  
Solubility and dissolution  
14:00 – 16:15 *Session 8*  
Effects of biological and organic materials  
16:25 – 18:05 *Session 9*  
Solid water interface reactions  
19:00 – 22:00 *Session 10*  
Poster session 2

**Wednesday, 21. September, 2005**

8:30 – 10:55 *Session 11*  
Diffusion and other migration processes  
11:15 – 12:30 *Session 12*  
Solid water interface reactions  
13:30 Excursion

**Thursday, 22. September, 2005**

8:30 – 10:05 *Session 13*  
Solid water interface reactions cont.  
10:25 – 12:30 *Session 14*  
Colloid formation and migration  
14:00 – 16:00 *Session 15*  
Complexation with inorganic and organic ligands  
16:20 – 17:30 *Session 16*  
Natural analogues  
19:00 Conference Banquet

**Friday, 23. September, 2005**

8:30 – 11:40 *Session 17*  
Modelling and model development  
11:40 – 12:10 Closing session

# Programme

## **SUNDAY (18. September)**

12:00            **REGISTRATION**

16:00            **OPENING SESSION**

16:40            **PLENARY INTRODUCTORY SESSION**

17:50            **PRIVATE VISIT OF THE PALAIS DES PAPES**

19:00            **RECEPTION**

## MONDAY (19. September)

### INTRODUCTION

Chair: *P. Toulhoat (France)*

8:15 CONFERENCE ANNOUNCEMENTS

- 8:30 RADIONUCLIDES MIGRATION CONCEPTUAL MODELS SELECTED FOR THE PERFORMANCE ASSESSMENT OF A HLLL RADIOACTIVE WASTE DISPOSAL IN A CLAY ENVIRONMENT (MEUSE / HAUTE-MARNE SITE, FRANCE) **A0-1**  
*P. Landais invited (France)*

### SESSION 1 A2-SOLID SOLUTION AND SECONDARY PHASE FORMATION

Chair: *I. Grenthe (Sweden) and S.L.S. Stipp (Denmark)*

- 9:15 INCORPORATION OF TRIVALENT ACTINIDES INTO THE CRYSTAL STRUCTURE OF HECTORITE **A2-1**  
*H. Pieper, D. Bosbach, P. J. Panak, K. Dardenne, J. Rothe, M. A. Denecke, Th. Fanghänel (Germany)*
- 9:40 SFM STUDY OF THE SECONDARY PHASE FORMATION ON UO<sub>2</sub> IN CONTACT WITH PHOSPHATE SOLUTIONS **A2-2**  
*J. Giménez, A. Rey, F. Clarens, I. Casas, V. Martí, J. de Pablo (Spain)*
- 10:05 DISSOLUTION RATES OF Nd-BRITHOLITE, A POTENTIAL LONG-TERM ACTINIDE STORAGE HOST ANALOGUE **A2-3**  
*C. Chairat, E.H. Oelkers, J. Schott, J-E. Lartigue, C. Guy (France)*

10:30 BREAK

### SESSION 2 B –MIGRATION BEHAVIOR OF RADIONUCLIDES

Chair: *R.J. Silva (USA) and J. Soler (Spain)*

- 10:50 TRANSPORT OF URANIUM IN A SUBOXIC AQUIFER **B5-1**  
*J. A. Davis, G. P. Curtis, M. J. Wilkins, M. Kohler, D. L. Naftz, J. R. Lloyd (USA)*
- 11:15 ENVIRONMENTAL MOBILITY OF Pu(IV) IN THE PRESENCE OF EDTA: MYTH OR REALITY? **B5-2**  
*D. Rai, D. A. Moore, A. R. Felmy, H. Bolton, Jr. (USA)*
- 11:40 CONCLUSIONS FROM IN-SITU ACTINIDE MIGRATION EXPERIMENTS IN ÄSPÖ HRL **B5-3**  
*B. Kienzler, P. Vejmelka, J. Römer, D. Schild, M. Jansson (Germany, Sweden)*
- 12:05 INVESTIGATION OF THE MIGRATION OF <sup>90</sup>Sr, <sup>237</sup>Np, <sup>238</sup>Pu AND <sup>241</sup>Am IN CHINESE LOESS **B5-4**  
*C.L.Liu, S.S.Li, Z.M.Wang, C.J.Lv, T.Chen (China)*
- 12:30 LUNCH BREAK

### SESSION 3 C-GEOCHEMICAL AND TRANSPORT MODELLING

Chair: *J. Carrera (Spain) and J. van der Lee (France)*

- 14:00 CAPTURING NATURAL PHYSICAL AND BIOGEOCHEMICAL COMPLEXITY IN REACTIVE TRANSPORT MODELS **C2-1**  
*C. Steefel invited (USA)*
- 14:45 INTERPRETATION OF SOLUTE TRANSPORT EXPERIMENTS IN COMPACTED Ca-BENTONITES USING INVERSE MODELING **C4-1**  
*J. Samper, Z. Dai, J. Molinero, M. García-Gutiérrez, T. Missana, M. Mingarro (Spain)*
- 15:10 MODELING RADIONUCLIDE SOURCE-TERMS AND RELEASE IN A SPENT NUCLEAR FUEL DISPOSAL **C5-1**  
*L. De Windt, C. Ferry, H. Schneider, H. Catalette, C. Poinssot, A. Poulesquen, C. Jegou (France)*
- 15:35 DIFFUSION OF Na<sup>+</sup> AND Sr<sup>2+</sup> TRACERS IN COMPACTED, SATURATED Na-BENTONITE: A PREDICTIVE MODEL **C3-1**  
*I.C. Bourg, G. Sposito, A.C.M. Bourg (USA, France)*
- 16:00 BREAK

### SESSION 4 A4-REDOX REACTIONS AND RADIOLYSIS

Chair: *K. Spahiu (Sweden) and B. Grambow (France)*

- 16:20 ELUCIDATION OF SELECTED SELENIUM GEOCHEMICAL PROCESSES IN REDUCING SEDIMENTS **A4-1**  
*C. Bruggeman, J. Vancluyzen, A. Maes (Belgium)*
- 16:45 THE DISSOLUTION OF THE SPENT FUEL MATRIX IN PRESENCE OF DIFFERENT OXIDIZING SPECIES **A4-2**  
*C. Jégou, B. Muzeau, V. Broudic (France)*
- 17:10 REDOX TRANSFORMATION OF URANIUM ACCOMPANYING MICROBIAL IRON REDUCTION **A4-3**  
*T. Behrends, P. Van Cappellen (The Netherlands)*
- 17:35 A DENSITY FUNCTIONAL THEORY STUDY ON REDOX REACTION OF URANIUM **A4-4**  
*T. Toraiishi, M. Kawaguchi, T. Tsuneda, S. Nagasaki, S. Tanaka (Japan)*
- 18:00 END

## SESSION 5 POSTER SESSION 1 (19.00 H – 22.00 H)

Chair: G. Cote (France) and H. Geckeis (Germany)

### PA1 SOLUBILITY AND DISSOLUTION

- PA1-1** SOLUBILITY OF ZIRCONIUM (IV) OXYHYDROXYDES: COMPOSITION AND STRUCTURAL EFFECTS, SURFACE PROPERTIES INFLUENCES  
*N. Michel, C. Landesman, M. Richard, L. Brohan, B. Grambow (France)*
- PA1-2** SOLUBILITY OF  $AnO_2 \cdot xH_2O(am)$  IN CARBONATE SOLUTION AND FORMATION OF TERNARY  $An(IV)$  HYDROXIDE-CARBONATE COMPLEXES  
*V. Neck, M. Altmaier, Th. Fanghänel (Germany)*
- PA1-3** HYDROUS  $PuO_{2+x}(s)$ : SOLUBILITY AND THERMODYNAMIC DATA  
*V. Neck, M. Altmaier, Th. Fanghänel (Germany)*
- PA1-4** LEACHING OF NEPTUNIUM FROM GARNET- AND MURATAITE-BASED CERAMICS  
*S.A. Perevalov, S.V. Stefanovsky, S.V. Yudin, A.G. Ptashkin (Russia)*
- PA1-5** ION INTERACTION (SIT) COEFFICIENTS FOR THE  $Th^{4+}$  ION DERIVED FROM TRACE ACTIVITY COEFFICIENTS IN  $NaClO_4$ ,  $NaNO_3$  AND  $NaCl$  SOLUTION  
*M. Altmaier, V. Neck, Th. Fanghänel, (Germany)*
- PA1-6** DETERMINATION OF THE RATE OF DISSOLUTION OF NON IRRADIATED  $UO_2(s)$  AS A FUNCTION OF  $H_2O_2$  CONCENTRATION, PRESSURE AND TEMPERATURE BY USING A CONTINUOUSLY STIRRED TANK FLOW-THROUGH REACTOR  
*I. Casas, J. de Pablo, J. Giménez, F. Clarens, M. Borrel, L. Sánchez (Spain)*
- PA1-7** SOLUBILITY PRODUCT OF TETRAVALENT NEPTUNIUM HYDROUS OXIDE AND ITS IONIC STRENGTH DEPENDENCE  
*K. Fujiwara, Y. Kohara, T. Mori (Japan)*
- PA1-8** THE STUDY OF LONG-TERM STABILITY IN LIQUID-SOLID PHASES FOR HLW DISPOSAL  
*Y.-Y. Wei, T.-H. Wang, C.-L. Tseng, J.-Y. Yang, C.-H. Ke, S.-C. Tsai, Y.-L. Jan, C.-B. Lee, P.-L. Lan, M.-H. Li, C.-N. Hsu, S.-P. Teng (Taiwan)*
- PA1-9** LEACHING OF  $\alpha$ -DOPED GELS  
*P. Jollivet, G. Parisot (France)*
- PA1-10** SOLUBILITY OF  $Tc(IV)$  OXIDES  
*D. J. Liu, X. H. Fan (China)*
- PA1-11** SOLUBILITY OF URANIUM (VI) IN BRINE  
*J.F. Lucchini, M. Borkowski, S. Ballard, D.T. Reed (USA)*
- PA1-12** SOLUBILITY OF MIXED-VALENCE  $U(IV-VI)$  AND  $Np(IV-V)$  HYDROXIDES IN SIMULATED GROUNDWATER AND 0.1 M  $NaClO_4$  SOLUTIONS  
*S.A. Perevalov, Yu. M. Kulyako, B.F. Myasoedov, Ai. Fujiwara, O. Tochiyama (Japan, Russia)*
- PA1-13** SOLUBILITY OF NEPTUNIUM AND TECHNETIUM DIOXIDES IN A YUCCA MOUNTAIN SIMULATED GROUNDWATERS  
*Yu. Kulyako, S. Perevalov, D. Malikov, C. E. Atkins-Duffin, B. Myasoedov (Russia, USA)*
- PA1-14** SOLUBILITY OF ZIRCONIUM(IV) HYDROUS OXIDE  
*T. Sasaki, T. Kobayashi, I. Takagi, H. Moriyama (Japan)*
- PA1-15** LEACHING OF IRRADIATED U/AI-FUEL ELEMENTS IN SALT BRINE: - MOBILISATION AND IMMOBILISATION BEHAVIOUR OF THE RADIONUCLIDES  
*H. Curtius, G. Kaiser (Germany)*
- PA1-16** DETERMINATION OF DIFFUSION COEFFICIENTS IN THE ALTERATION LAYER OF SON68 AND BASALTIC GLASS  
*D. Alincant, Ph. Berne, S. Gin, P. Jollivet (France)*

**PA1-17** URANIUM MOBILITY IN MINE AREAS: EVALUATION OF THE WATER -ROCK INTERACTION  
*P. Zuddas, A. Rocha Scislawski, D. Faivre, O. Lopez (France)*

## **PA2 SOLID SOLUTION AND SECONDARY PHASE FORMATION**

**PA2-1** A SPECTROSCOPIC AND MICROSCOPIC STUDY OF URANIUM SPECIATION IN THE INFILTRATION POND SEDIMENTS AT HANFORD, USA  
*Z. Wang, J. M. Zachara, J. P. McKinley, S. C. Smith, O. Qafoku, J.G. Catalano (USA)*

**PA2-2** INCORPORATION OF TRIVALENT ACTINIDES (Cm(III)) IN CALCITE. A TIME RESOLVED LASER FLUORESCENCE SPECTROSCOPY (TRLFS) STUDY  
*M. Marques Fernandes, T. Stumpf, T. Rabung, D.Bosbach, A. Bauer, T. Fanghänel (Germany)*

**PA2-3** COPRECIPITATION OF Th(IV) AND La(III) WITH UO<sub>2</sub>  
*G. Rousseau, T. Mennecart, M. Fattahi, B. Grambow, F. Boucher, G. Ouvrard (France)*

**PA2-4** WHAT CONCENTRATION OF ACTINIDES CAN BE PACKED INTO CALCITE? HINTS FROM RARE EARTH ELEMENT (REE) COMPOSITION  
*J. Christiansen, S.L.S. Stipp, J.A. Baker, T. Waight (Denmark, New Zealand)*

## **PA3 COMPLEXATION WITH INORGANIC AND ORGANIC LIGANDS**

**PA3-1** FORMATION OF <sup>99</sup>Tc COMPLEXES UNDER HIGH pH REDUCING CONDITIONS  
*S. Aldridge, P. Warwick, N. Evans, S. Anton-Gascon, S. Vines (UK)*

**PA3-2** PHOTODYNAMIC PROCESSES IN Cm(III)/Tb(III) HUMIC AND FULVIC ACID COMPLEXES  
*F. Claret, M. Kunke, T. Rabung, T. Stumpf, R. Klenze, J.I. Kim, T. Fanghänel, G. Buckau (Germany, France)*

**PA3-3** CONDENSATION MECHANISMS OF TETRAVALENT TECHNETIUM IN CHLORIDE MEDIA  
*F.Poineau, M.Fattahi, G. Montavon, B.Grambow (France)*

**PA3-4** COMPLEX FORMATION OF SMALL ORGANIC LIGANDS WITH URANIUM(VI) - COMPARISON OF STABILITY CONSTANTS WITH PROTON DISSOCIATION  
*G. Geipel, D. Vulpius, V. Brendler, G. Bernhard (Germany)*

**PA3-5** EXAFS INVESTIGATIONS OF U(IV) SPECIES IN AQUEOUS SOLUTIONS WITH A NEWLY DEVELOPED SPECTRO-ELECTROCHEMICAL CELL  
*C. Hennig, J. Tutschku, G. Palladino, F. Poineau, K. Schmeide, A. Rossberg, A.C. Scheinost, G. Bernhard (Germany, Sweden, France)*

**PA3-6** SIMULTANEOUS ANALYSIS OF FREE AND HUMIC ACID COMPLEXED EUROPIUM AND GADOLINIUM SPECIES BY CE-ICP-MS  
*R. Kautenburger, K. Nowotka, H.P. Beck (Germany)*

**PA3-7** DFT AND EXAFS, MUTUALLY ENHANCING TOOLS FOR STRUCTURE ELUCIDATION OF Tc COMPLEXES  
*E. Breynaert, C. Bruggeman, A. Maes (Belgium)*

**PA3-8** DISSOLVED FORMS OF Am(III) IN THE PRESENCE OF GROUNDWATER HUMIC SUBSTANCES  
*S. Nagao, T. Tanaka, Y. Nakaguchi, N. Fujitake (Japan)*

**PA3-9** ESTIMATING THE STABILITIES OF AQUEOUS ACTINIDE COMPLEXES WITH SULFOXYANIONS  
*V. Phrommavanh, M. Descostes, P. Vitorge, C. Beaucaire, J.P. Gaudet (France)*

**PA3-10** PROTONATION AND LACTONIZATION OF  $\alpha$ -ISOSACCHARINIC ACID  
*L. Rao, G. Tian, Z. Zhang, D. Rai (USA)*

- PA3-11** PREPARATION AND CHARACTERISATION OF IMMOBILISED HUMIC ACID ON A SILICON WAFER  
*Gy. Szabó, J. Guzzi, J. Telegdi, I. Pashalidis, W. Szymczak, G. Buckau (Hungary, Cyprus, Germany)*
- PA3-12** DISSOCIATION OF  $M(\text{CO}_3)_3^{3-}$  INTO  $M(\text{CO}_3)_2^-$  FOR  $M^{3+} = \text{Am}^{3+}$  AND  $\text{Cm}^{3+}$  AT 10 TO 70°C  
*Th. Vercoeur, P. Vitorge, B. Amekraz, E. Giffaut, S. Hubert, Ch. Moulin (France)*
- PA3-13** APPLICATION OF THE NICA DONNAN MODEL TO THE COMPLEXATION OF RADIONUCLIDES BY HUMIC SUBSTANCES  
*L. Marang, M.F. Benedetti, P. Reiller (France)*
- PA3-14** INTERACTION OF URANIUM(VI) AND HUMIC ACID UNDER NEUTRAL pH CONDITIONS  
*S. Sachs, G. Geipel, V. Brendler, G. Bernhard (Germany)*
- PA3-15** COMPLEXING PROPERTIES OF  $\alpha$ -ISOSACCHARINATE: THORIUM  
*S. Allard, C. Ekberg (Sweden)*
- PA3-16** COMPLEXATION OF Eu(III) BY CITRATE IN AQUEOUS SOLUTION  
*N. Aoyagi, T. Toraishi, S. Nagasaki, S. Tanaka (Japan)*
- PA3-17** COMPLEXATION, REDOX BEHAVIOUR, AND ADSORPTION OF PLUTONIUM IN AQUEOUS SYSTEMS  
*N. L. Banik, S. Bürger, R. A. Buda, J. V. Kratz, B. Kuczewski, N. Trautmann (Germany)*
- PA3-18** NEPTUNIUM(V, VI) AND PLUTONIUM(V, VI) INTERACTION WITH MALONATE AND PHTHALATE IONS IN NEUTRAL AQUEOUS SOLUTIONS; CRYSTALLINE COMPOUND FORMATION  
*A.A.Bessonov, M.S.Grigoriev, N.N.Krot (Russia)*
- PA3-19** METAL INDUCED HUMIC ACID AGGLOMERATION AND ITS INFLUENCE ON ACTINIDE-HUMIC-COLLOID DYNAMICS  
*M. Bouby, H. Geckeis, T. Fanghänel (Germany)*
- PA3-20** THERMOCHEMICAL DATA TO DESCRIBE ACTINIDE PARTITIONING TO BACTERIA: A MIXED SOLVENT APPROACH  
*S. B. Clark, A. R. Felmy, O. Qafoku, Z. Wang (USA)*
- PA3-21** DISSOCIATION BEHAVIOR OF  $\text{Np(IV)}$  FROM HUMIC ACID COLLOIDS  
*K. Iijima, S. Tobitsuka, Y. Kohara (Japan)*
- PA3-22** STUDY OF LUMINESCENCE PROPERTY OF  $\text{U(IV)}$  COMPLEXES FOR URANIUM SPECIATION IN AQUEOUS SOLUTION  
*A. Kirishima, R. Nagaishi, T. Kimura (Japan)*
- PA3-23** NEPTUNIUM SPECIATION (COMPLEXATION AND REDOX BEHAVIOUR) IN AQUEOUS CITRATE MEDIUM  
*L. Bonin, E. Ansoborlo, Ph. Moisy (France)*
- PA3-24** DETERMINATION OF THE THERMODYNAMIC QUANTITIES OF THE COMPLEXATION BETWEEN EUROPIUM(III) AND SOME ORGANIC ACIDS BY MICROCALORIMETRY  
*H. Kitano, Y. Ohnishi, N. Sato, O. Tochiyama (Japan)*
- PA3-25** POTENTIOMETRIC INVESTIGATIONS ON THE INTERACTION OF HUMIC ACID WITH POLYVALENT METAL IONS ( $\text{Cu(II)}$ ,  $\text{Eu(III)}$  AND  $\text{Th(IV)}$ )  
*C. Kolokassidou, I. Pashalidis (Cyprus)*
- PA3-26** REDUCTION OF  $\text{Pu(V)}$  AND  $\text{Np(V)}$  BY LEONARDITE HUMIC ACIDS AND THEIR QUINONOID-ENRICHED DERIVATIVES  
*N.S. Shcherbina, St.N. Kalmykov, I.V. Perminova, A.N. Kovalenko (Russia)*



- PA3-27** INVESTIGATION OF COMPLEXATION OF THORIUM BY HUMIC ACID USING CHEMICALLY IMMOBILISED HUMIC ACID ON SILICA GEL  
*Gy. Szabó, J. Gucci, P. Reiller, H. Geckeis, R. A. Bulman (Hungary, France, Germany, UK)*
- PA3-28** STRUCTURE OF URANIUM(VI)-NUCLEOTIDE COMPLEXES STUDIED BY MULTINUCLEAR NMR SPECTROSCOPY  
*Z. Szabó, I. Furó (Sweden)*
- PA3-29** POTENTIOMETRIC STUDY ON THE COMPLEXATION OF CALCIUM WITH SOME HUMIC AND FULVIC ACIDS - DEPENDENCE OF THE INTERACTION ON CALCIUM CONCENTRATION  
*J. Du, T. Sato, A. Kirishima, O. Tochiyama, N. Sato (Japan, China)*
- PA3-30** TIME-DEPENDENT DENSITY FUNCTIONAL STUDY ON LUMINESCENCE CHARACTERISTICS OF TRIVALENT LANTHANIDE COMPLEXES  
*T. Tsuneda, M. Asakura, T. Toraiishi, S. Tanaka (Japan)*
- PA3-31** SULFATE COMPLEXATION OF TRIVALENT LANTHANIDES PROBED BY NANO-ELECTROSPRAY MASS SPECTROMETRY AND TIME-RESOLVED LASER-INDUCED FLUORESCENCE SPECTROSCOPY  
*Th. Vercouter, B. Amekraz, Ch. Moulin, E. Giffaut, P. Vitorge (France)*

#### **PA4 REDOX REACTIONS AND RADIOLYSIS EFFECTS**

- PA4-1** SPENT FUEL UO<sub>2</sub> MATRIX CORROSION BEHAVIOUR STUDIES THROUGH ALPHA-DOPED UO<sub>2</sub> PELLETS LEACHING  
*B. Muzeau, C. Jégou, V. Broudic (France)*
- PA4-2** THE EFFECT OF DISSOLVED HYDROGEN ON THE SPENT FUEL PROPERTIES OBSERVED DURING LEACHING UNDER ARGON ATMOSPHERE.  
*D. Cui, P. Nilsson, T. Lundström, K. Spahiu (Sweden)*
- PA4-3** ON IRON RADIONUCLIDE INTERACTIONS AND IN SITU MEASUREMENT OF IRON CORROSION PRODUCTS  
*A. Puranen, D. Cui, M. Jonsson, A. M. Scheidegger, P. Wersin, K. Spahiu (Sweden, Switzerland)*
- PA4-4** ON URANIUM PRECIPITATES AT THE SIMULATED NEAR-FIELD CONDITIONS  
*V. Robit, D. Cui, C. Poinssot, B. Grambow, A. Puranen, V. Rondinella, K. Spahiu (France, Sweden, EU)*
- PA4-5** INFLUENCE OF WATER RADIOLYSIS ON THE MOBILIZATION OF Tc(IV) IN BENTONITE CLAY: RESULTS FROM FIELD EXPERIMENTS AT ÄSPÖ HRL  
*M. Jansson, T.E. Eriksen (Sweden)*
- PA4-6** INTERACTIONS AND STABILITY OF HYPOCHLORITE, HYDROGEN PEROXIDE AND URANIUM (VI) IN BRINE  
*J.F. Lucchini, M. Borkowski, S. Ballard, D.T. Reed (USA)*
- PA4-7** REDOX STABILITY OF NEPTUNIUM(V) IN THE PRESENCE OF HUMIC SUBSTANCES OF VARYING FUNCTIONALITY  
*K. Schmeide, G. Geipel, G. Bernhard (Germany)*
- PA4-8** IRON REDUCTION OF PLUTONIUM (VI) IN BRINE  
*D. T. Reed, J. F. Lucchini, S. B. Aase, J. Kropf (USA)*
- PA4-10** ALTERATION OF UO<sub>2</sub>/H<sub>2</sub>O INTERFACES UNDER IRRADIATION: POTENTIALITY OF <sup>2</sup>H ISOTOPIC TRACING TECHNIQUE  
*E. Mendès, C. Corbel, T. Mennecart, P. Simon, T. Sauvage (France)*
- PA4-11** UO<sub>2</sub>(s) OXIDATION/DISSOLUTION RATES IN CARBONATE MEDIA BY EXTERNAL ALPHA IRRADIATION UNDER REDUCING CONDITIONS  
*T. Suzuki, A. Abdelouas, B. Grambow, T. Mennecart, G. Blondiaux (France)*

**PA4-12** HYDROLYSIS OF Pu(IV) STUDIED BY MEASUREMENTS OF THE Pu(IV)/Pu(III) REDOX EQUILIBRIUM COMBINED WITH SPECTROSCOPY  
*H.R. Cho, C. Bitea, C. M. Marquardt, V. Neck, A. Seibert, C. Walther, J.I. Yun, Th. Fanghänel (Germany)*

**PA4-13** COMPARATIVE STUDY ON SPECTROSCOPIC PROPERTIES OF OXIDATION STATES FOR Pu IN NITRIC ACID AND HYDROCHLORIC MEDIA USING ABSORPTION SPECTROSCOPY  
*M. H. Lee, Y. J. Park, W. H. Kim (Korea)*

**PA4-14** THE STABILITY OF Pu(III) IN SORPTION STUDIES  
*M. Olsson (Sweden)*

**PA4-15** STUDY OF CHANGES IN U OXIDATION STATES DURING ANOXIC SAMPLE DISSOLUTION  
*S. Salminen, J. Suksi (Finland)*

**PA4-16** THE BEHAVIOR OF TECHNETIUM IN NATURAL WATERS EQUILIBRATED WITH UNDERGROUND CLAY SAMPLES FROM MEUSE/Haute-Marne AND FROM MONT TERRI  
*V. Peretroukhine, C. Sergeant, S. Poulain, M.H. Vesvres, M. Simonoff (France, Russia)*

**PA4-17** REDOX BEHAVIOR OF URANIUM IN THE PRESENCE OF ORGANIC LIGANDS  
*Y. Suzuki, T. Nankawa, T. Yoshida, T. Ozaki, T. Ohnuki, A. J. Francis, S. Tsushima, Y. Enokida, I. Yamamoto (Japan, USA)*

**PA4-18** DISSOLUTION OF A ZIRCONOLITE CERAMIC WASTE-FORM UNDER PROTON AND ALPHA IRRADIATION  
*M. Tribet, N. Toulhoat, S. Gavarini, N. Moncoffre, A. Chevarier, N. Millard-Pinard, C. Jégou, G. Leturcq, C. Corbel, P. Toulhoat, O. Vittori, J.L. Imbert (France, Switzerland)*

## **PA5** **SOLID-WATER INTERFACE REACTIONS**

**PA5-1** DENSITY FUNCTIONAL STUDIES OF URANYL ION SORPTION ON TiO<sub>2</sub> (110) SURFACE  
*H. Perron, C. Domain, J. Roques, J. Vandenborre, R. Drot, E. Simoni, H. Catalette (France)*

**PA5-2** REE INTERACTIONS WITH HYDROXYAPATITE. FORMATION OF SECONDARY SOLID PHASES.  
*F. Seco, J. de Pablo, J. Bruno (Spain)*

**PA5-3** Np(V)O<sub>2</sub><sup>+</sup> SORPTION ON HYDROXYAPATITE-EFFECT OF CALCIUM AND PHOSPHATE ANIONS  
*P. Thakur, G.R. Choppin (USA)*

**PA5-4** TECHNETIUM ADSORPTION ON STIBNITE  
*V. Peretroukhine, C. Sergeant, G. Devès, M.H. Vesvres, M. Simonoff (France, Russia)*

**PA5-5** STUDY OF THE INTERACTION OF SeO<sub>3</sub><sup>2-</sup>, I<sup>-</sup>, Cs<sup>+</sup> AND Ni<sup>2+</sup> ON CONSOLIDATED BENTONITE  
*G. Montavon, E. Alhaji, D. Le Botlan, B. Grambow (France)*

**PA5-6** SORPTION OF CATIONIC AND ANIONIC SPECIES ON PYRITE IN ANOXIC CONDITIONS  
*A. Naveau, F. Monteil-Rivera, J. Dumonceau, H. Catalette (France)*

**PA5-7** Cm(III) SORPTION ONTO ALUMINUM OXIDES/HYDROXIDES  
*Th. Rabung, H. Geckeis, D. Schild, S. Mitchell, Th. Fanghänel (Germany)*

**PA5-8** COMPARATIVE EXAFS STUDY OF URANIUM(VI) AND NEPTUNIUM(V) SORPTION ONTO KAOLINITE  
*T. Reich, S. Amayri, Ta. Reich, J. Jermolajev (Germany)*

- PA5-9** HIGH RESOLUTION SOLID STATE NMR STUDY ON THE FINE STRUCTURAL CHANGE OF NA-MONTMORILLONITE UNDER A STRONG ALKALINE ENVIRONMENT  
*T. Takahashi, K. Suzuki, T. Okubo, Y. Ikeda (Japan)*
- PA5-10** TEMPERATURE EFFECT ON SORPTION OF CATIONS ONTO CLAY MINERALS: COMPLEXATION MODELING AND EXPERIMENTAL MEASUREMENTS UP TO 150°C  
*E. Tertre, G. Berger, S. Castet, M. Loubet, E. Giffaut, E. Simoni, H. Catalette (France)*
- PA5-11** ARE DISTRIBUTION COEFFICIENTS MEASURED FROM BATCH EXPERIMENTS MEANINGFUL FOR QUANTIFYING RETENTION IN COMPACTED MATERIAL ?  
*F. Goutelard, Y. Charles, J. Page (France)*
- PA5-12** IDENTIFICATION OF ADSORBED U(VI) SURFACE SPECIES ON MUSCOVITE BY TRLFS AND HAADF-STEM  
*T. Arnold, S. Utsunomiya, G. Geipel, R. C. Ewing, N. Baumann, V. Brendler (Germany, USA)*
- PA5-13** COOPERATIVE SORPTION OF Fe(II), Co(II) AND Eu(III) ON NATURAL MONTMORILLONITE.  
*A. Géhin, C. Tournassat, L. Charlet (France)*
- PA5-14** A STUDY OF IODINE, CESIUM, AND STRONTIUM SORPTION ON ALKALI-EARTH HYDROPHOSPHATES FROM THE AQUEOUS PHASE  
*S.A. Kulyukhin, E.P. Krasavina, L.V. Mizina, I.A. Rumer, N.A. Konovalova (Russia)*
- PA5-15** NEPTUNIUM(V) SORPTION ONTO KAOLINITE IN THE ABSENCE AND PRESENCE OF CO<sub>2</sub>  
*S. Amayri, Ta. Reich, T. Reich (Germany)*
- PA5-16** A STUDY ON THE STABILITY AND SORPTION OF Ca-BENTONITE COLLOIDS  
*M. H. Baik, J. H. Park, S. Y. Lee, W. J. Cho, P. S. Hahn (Korea)*
- PA5-17** SURFACE CHARGES AND Np(V) SORPTION ON AMORPHOUS Al- AND Fe-SILICATES  
*M. Del Nero, A. Assada, B. Madé, R. Barillon, G. Duplâtre (France)*
- PA5-18** EXPERIMENTAL INVESTIGATION OF THE INTERACTION OF TOURNEMIRE ARGILLITE WITH SIMPLIFIED CONCRETE FLUIDS  
*E. Devol-Brown, E. Tinseau, A. Mifsud, C. Bouchard, D. Stammose (France)*
- PA5-19** TEMPERATURE EFFECT ON URANYL RETENTION BY PHOSPHATED SUBSTRATES AND STRONTIUM TITANATE  
*G. Almazan-Torres, N. Finck, G. Garcia, R. Drot, E. Simoni, M.C. Charbonnel, H. Catalette (France)*
- PA5-20** THE ROLE OF pCO<sub>2</sub>, pH AND GROUNDWATER COMPOSITION ON NEPTUNIUM(V) ADSORPTION TO NATURAL ALLUVIAL AQUIFER SEDIMENT: SURFACE COMPLEXATION MODELING AND COMPARISON TO URANIUM(VI)  
*P.B. Buckley, B.D. Honeyman, J.A. Davis, J.F. Ranville (USA)*
- PA5-21** THE ION-EXCHANGE PROPERTIES OF THE TOURNEMIRE ARGILLITE. II MECHANISMS OF ADSORPTION OF CESIUM AND SELENIUM IV  
*P. Jacquier, J. Ly, B. Grenut, C. Beaucaire (France)*
- PA5-22** SORPTION OF SILICATE SPECIES ON CORROSION PRODUCTS  
*N. Jordan, C. Lomenech, N. Marmier, J.J. Ehrhardt, E. Giffaut (France)*
- PA5-23** ROLE OF SURFACE-ENHANCED REDUCTION DURING Pu(V) SORPTION TO SEDIMENTS  
*B. A. Powell, D. I. Kaplan, R. A. Fjeld, S. M. Serkiz, J. Coates (USA)*
- PA5-24** SORPTION OF Cs TO BIOTITE  
*J. Kyllönen, M. Hakanen, A. Lindberg (Finland)*

- PA5-25** NICKEL UPTAKE BY CALCITE  
*L.Z. Lakshatnov, L. Karlby, S.L.S. Stipp (Denmark, Russia)*
- PA5-26** INTERACTIONS INVOLVING WASTE PACKAGE COMPONENTS - IMPLICATIONS FOR RADIONUCLIDE SOURCE-TERMS OF CERAMIC-BASED WASTEFORMS  
*H. Li, P.J. McGlenn, Y. Zhang, T.E. Payne (Australia)*
- PA5-27** ON A MECHANISTIC APPROACH FOR THE DETERMINATION OF SORPTION PARAMETERS IN A COMPLEX ROCK SYSTEM  
*T. Missana, U. Alonso, M. García-Gutiérrez, A. Patelli, V. Rigato (Spain, Italy)*
- PA5-28** COMPARISON OF Eu ENVIRONMENT IN Eu-PAA AND Eu-PAA-Al<sub>2</sub>O<sub>3</sub> COMPLEXES: A SPECTROSCOPIC STUDY  
*G. Montavon, B. Grambow (France)*
- PA5-29** EFFECT OF THE ORGANIC MATTER ON THE ADSORPTION OF Eu(III)/Ni(II) ONTO THE CALLOVO-OXFORDIAN CLAYSTONE FROM BURE (FRANCE).  
*M. Azouazi, G. Montavon, R. Michels, P. Reiller, F. Mercier, V. Moulin, B. Grambow (France)*
- PA5-30** THERMODYNAMICS OF PROTON BINDING AT THE ALUMINA-WATER INTERFACE REVISITED  
*J.-P. Morel, A. Guillaud, N. Marmier, N. Morel-Desrosiers (France)*
- PA5-31** INTERACTION OF U(VI) WITH PYRITE, GALENA AND THEIR MIXTURES: A THEORETICAL AND MULTITECHNIQUE APPROACH  
*H. Aubriet, B. Humbert, M. Perdicakis (France)*
- PA5-32** THE SORPTION REACTIONS OF Ni(II) WITH SWEDISH NATURAL CHLORITE SAMPLES  
*Å. Zazzi, M. Molera, I. Puigdomenech (Sweden)*
- PA5-33** ADSORPTION OF U(VI) FROM AQUEOUS SOLUTIONS ONTO DOLOMITE  
*G. Keceli, A. Kilislioglu, G. Aras (Turkey)*
- PA5-34** ADSORPTION KINETICS OF UO<sub>2</sub><sup>2+</sup> ON BENTONITE  
*A. Kilislioglu, B. Bilgin, G. Keceli (Turkey)*
- PA5-35** SORPTION OF CAESIUM AND STRONTIUM ONTO CALCIUM SILICATE HYDRATE IN SALINE GROUNDWATER  
*D. Sugiyama, T. Fujita (Japan)*
- PA5-36** MODELLING SORPTION EDGE AND ISOTHERM DATA FOR THE UPTAKE OF Am(III), Np(V), Pa(V) AND U(VI) ON MONTMORILLONITE  
*M. H. Bradbury, B. Baeyens (Switzerland)*
- PA5-37** EUROPIUM SORPTION ON ZIRCONIA AT ELEVATED TEMPERATURES: EXPERIMENTAL STUDY AND MODELING  
*N. Eglizaud, H. Catalette (France)*
- PA5-38** MECHANISMS OF CESIUM SORPTION ONTO MAGNETITE.  
*N. Granizo, T. Missana (Spain)*
- PA5-39** EVALUATION OF Sn(IV), Pu (IV) AND Nb(V) SORPTION ONTO 4 ARGILLITES SAMPLES FROM THE CALLOVO-OXFORDIAN LEVEL AT BURE (FRANCE) FROM 8 SEDIMENTARY WATERS.  
*C. Latrille, J. Ly, M. Herbette (France)*
- PA5-40** THE EFFECT OF CARBONATE ON NEPTUNIUM SORPTION BY HYDROXYAPATITE.  
*R. C. Moore, K. Holt (USA)*
- PA5-41** ADSORPTION BEHAVIOR OF U(VI) AND Eu(III) ONTO Ti(IV) AND Fe(III) PARTIALLY COATED SILICA SURFACE  
*K. K. Park, H.-J. Im, Y. J. Park, W. H. Kim (Korea)*

- PA5-42** SORPTION PROPERTIES OF BENTONITE CLAYS TOWARDS Pu(IV), U(VI), Np(V) AND Cs: EXPERIMENTAL AND SURFACE COMPLEXATION STUDY  
*M.N. Sabodina, St.N. Kalmykov, Yu.A. Sapozhnikov, T.A. Gupalo, V.P. Beigul (Russia)*
- PA5-43** Am(III), Eu(III), Tb(III) AND Co(II) SORPTION CHARACTERISTICS WITH GEOLOGICAL PROPERTY DIFFERENCES  
*Y.Y. Yoon, K.Y. Lee, S.G. Lee, S.Y. Cho, Y. Kim (Korea)*
- PA5-44** INVESTIGATION OF THE INFLUENCE OF HUMIC ACID ON THE INTERACTION OF U(VI) WITH KAOLINITE: SORPTION AND SPECTROSCOPIC STUDIES  
*A. Krepelová, S. Sachs, A. Rossberg, G. Bernhard (Germany)*

## **PA6 COLLOID FORMATION**

- PA6-1** SPECIATION CHANGES OF <sup>60</sup>Co AND <sup>137</sup>Cs IN CONTAMINATED GROUNDWATER: SIZE FRACTIONATION, HYDROPHOBIC/HYDROPHILIC FRACTIONATION AND KINETICS OF COMPETITION WITH AN ION EXCHANGE SURFACE.  
*F. Caron, C. Simister (Canada)*
- PA6-2** PROVENANCE AND STABILITY OF COLLOID-BORNE ACTINIDES: INCORPORATION OF ACTINIDES (III, IV, V, VI) INTO ALUMINOSILICATE COLLOIDS  
*D. Breban, A. Priemyshev, M. A. Kim, P. J. Panak, J. I. Yun, J. I. Kim, Th. Fanghänel (Germany)*
- PA6-3** TECHNETIUM HYDROLYSIS AND EIGENCOLLOID FORMATION  
*E. Breynaert, A. Maes (Belgium)*
- PA6-4** <sup>99</sup>TECHNETIUM SPECIATION AND PATHWAYS UNDER BOOM CLAY REDUCING CONDITIONS WHEN STARTING FROM DIFFERENT INITIAL CONDITIONS  
*C. Bruggeman, A. Maes, J. Vancluysen (Belgium)*
- PA6-5** THE ROLE OF HUMIC ACID ON THE FORMATION OF HAS (HYDROXY-ALUMINOSILICATE) COLLOID-BORNE ACTINIDES  
*A. Priemyshev, D. Breban, M. A. Kim, P. J. Panak, A. Mansel, J. I. Yun, J. I. Kim, Th. Fanghänel (Germany)*
- PA6-6** FORMATION OF COLLOIDS BY THE WEATHERING OF ROCK MATERIAL  
*H. Zänker, T. Arnold, G. Hüttig, H. Nitsche, G. Bernhard (Germany, USA)*
- PA6-7** TEMPERATURE EFFECT ON THE STABILITY OF BENTONITE COLLOIDS IN WATER  
*S. Garcia, M. Jonsson, S. Wold (Sweden)*
- PA6-8** INVESTIGATION OF ENVIRONMENTALLY RELEVANT COLLOIDS BY LASER-INDUCED BREAKDOWN DETECTION (LIBD)  
*K. Opel, S. Hübener, S. Weiß, H. Zänker, G. Bernhard (Germany)*
- PA6-9** SPECTROSCOPIC STUDIES ON COLLOID-BORNE URANIUM  
*K.-U. Ulrich, A. Rossberg, S. Weiß, H. Foerstendorf, V. Brendler, A.C. Scheinost, H. Zänker (Germany)*
- PA6-10** FORMATION OF COLLOID-BORNE An(III): SPECIATION OF LIGAND COMPETITION IN THE An(III)-Al-Si-HUMIC ACID SYSTEM BY SENSITIZED FLUORESCENCE SPECTROSCOPY  
*P. J. Panak, M. A. Kim, J. I. Yun, J. I. Kim, Th. Fanghänel (Germany)*

## Tuesday (20. September)

### SESSION 6 A7-INNOVATIVE EXP. METHODS

Chair: *F.R. Livens (UK) and Th. Fanghänel (Germany)*

- 8:30 IN SITU SPECIATION OF MINERAL/ELECTROLYTE INTERFACES BY LINEAR AND NONLINEAR OPTICAL VIBRATIONAL SPECTROSCOPY **A7-1**  
*M. Flörsheimer invited, K. Kruse, R. Klenze, Th. Fanghänel, J.-I. Kim (Germany)*
- 9:15 USE OF ATTENUATED TOTAL REFLECTION - INFRARED SPECTROSCOPY FOR THE DETERMINATION OF THE STRUCTURE OF SORBED SPECIES ON METAL OXIDES **A7-2**  
*G. Lefèvre, M. Fédoroff (France)*
- 9:40 X-RAY MICROSPECTROSCOPY: A TOOL FOR MICRO-SCALE RADIONUCLIDE SPECIATION IN HETEROGENEOUS NUCLEAR WASTE REPOSITORY MATERIALS **A7-3**  
*A. M. Scheidegger, D. Grolimund, M. Vespa, M. Harfouche, E. Wieland, P. Wersin, D. Cui, K. Spahiu (Switzerland, Sweden)*
- 10:05 NEW PROSPECTS FOR PLUTONIUM SPECIATION - CE-RIMS AND CE-DAD-ICP-MS **A7-4**  
*B. Kuczewski, N. L. Banik, S. Bürger, R. Buda, J. V. Kratz, N. Trautmann (Germany)*
- 10:30 Eu MIGRATION IN CALLOVO-OXFORDIAN ARGILLITE : ON THE USE OF MICRO LASER-INDUCED BREAKDOWN SPECTROSCOPY ( MICRO LIBS) AS A MICROANALYSIS TOOL **A7-5**  
*D. Menut, M. Descostes, P. Meier, J. Radwan, P. Mauchien, C. Poinssot (France)*
- 10:55 BREAK

### SESSION 7 A1-SOLUBILITY AND DISSOLUTION

Chair: *V. Neck (Germany) and W.H. Kim (Korea)*

- 11:15 EFFECT OF LOW ALPHA-RADIATION FIELD ON CORROSION RATES OF UO<sub>2</sub> UNDER ANOXIC CONDITIONS **A1-1**  
*J. Cobos, V. V. Rondinella (EU)*
- 11:40 SOLUBILITY OF U(VI) AND FORMATION OF CaU<sub>2</sub>O<sub>7</sub>·3H<sub>2</sub>O(cr) IN ALKALINE CaCl<sub>2</sub> SOLUTIONS **A1-2**  
*M. Altmaier, V. Neck, R. Müller, Th. Fanghänel (Germany)*
- 12:05 PROCESSES AT INTERFACES: THE EFFECT OF CARBONATE ON THE DISSOLUTION OF IRON AND URANIUM OXIDES **A1-3**  
*M. Grivé, L. Duro, J. de Pablo, J. Bruno (Spain)*
- 12:30 LUNCH BREAK

### SESSION 8 B4-EFFECTS OF BIOLOGICAL AND ORGANIC MATERIAL

Chair: *G.R. Choppin (USA) and G. Bernhard (Germany)*

- 14:00 INTERACTION OF *Desulfovibrio äspöensis* WITH PLUTONIUM **B4-1**  
*H. Moll, M. Merroun, S. Selenska-Pobell, G. Bernhard (Germany)*
- 14:25 ASSOCIATIONS OF EUROPIUM(III) WITH GRAM-NEGATIVE BACTERIA **B4-2**  
*T. Ozaki, T. Kimura, Y. Takahashi, T. Ohnuki, A. J. Francis (Japan, USA)*

- 14:50 MICROBIALLY PRODUCED EXTRACELLULAR POLYSACCHARIDIC Pu(IV)-  
BINDING LIGANDS **B4-3**  
*C.-C. Hung, K. A. Roberts, K. A. Schwehr, P.H. Santschi (USA)*
- 15:15 RADIONUCLIDES CAN BE MOBILIZED BY BACTERIA FROM THE  
SUBSURFACE GROWN UNDER AEROBIC AS WELL AS ANAEROBIC  
CONDITIONS **B4-4**  
*A. Johnsson, J. Arlinger, Y. Albinsson, T. Andlid, K. Pedersen (Sweden)*
- 15:40 'STATIC COLUMNS' FOR THE ASSESSMENT OF THE MICROBIAL  
SOLUBILIZATION OF Pu IN SATURATED SYSTEMS **B4-5**  
*A.D. Diaz, J. B. Gillow, B.D. Honeyman, A.J. Francis (USA)*
- 16:05 BREAK

## SESSION 9 **A5-SOLID-WATER INTERFACE REACTIONS**

*Chair: T.E. Payne (Australia) and S.B. Clark (USA)*

- 16:25 URANIUM (VI) INTERACTION WITH PYRITE (FeS<sub>2</sub>): CHEMICAL AND  
SPECTROSCOPIC STUDIES. **A5-1**  
*N. Eglizaud, F. Miserque, E. Simoni, M. Schlegel, M. Descostes (France)*
- 16:50 ADSORPTION OF OXALATE AND TRIVALENT f-ELEMENTS TO SOIL  
MINERALS: SURFACE COMPLEXATION MODELING **A5-2**  
*L.C. Hull, S.E. Pepper, B.N. Bottenus, S.B. Clark (USA)*
- 17:15 SORPTION OF Cs, Ni, Ac(III), Tc(IV), Zr, U(IV) AND Se(IV) ON MX 80  
BENTONITE: AN EXPERIMENTAL APPROACH TO ASSESS MODEL  
UNCERTAINTY **A5-3**  
*B. Grambow, M. Fattahi, G. Montavon, E. Giffaut (France)*
- 17:40 SORPTION OF CESIUM ON GRANITE UNDER AEROBIC AND ANAEROBIC  
CONDITIONS **A5-4**  
*C.-B. Lee, P.-L. Lan, Y.-L. Jan, Y.-Y. Wei, S.-P. Teng, C.-N. Hsu (Taiwan)*
- 18:05 END

## SESSION 10 **POSTER SESSION 2 (19.00h – 22.00h)**

*Chair: E. Simoni (France) and H. Catalette (France)*

### PA7 **INNOVATIVE EXPERIMENTAL METHODS**

- PA7-1** SPECIATION AND QUANTIFICATION OF TECHNETIUM-99 IN SAMPLE AT  
ENVIRONMENTAL CONCENTRATION  
*L.M. Kasprzak, M. Agarande, M.Fattahi (France)*
- PA7-2** DEVELOPMENT OF pH-Eh MULTI-STAT SYSTEM AND ITS APPLICATION TO  
URANIUM CHEMISTRY  
*A. Kirishima, Y. Kitatsuji, T. Kimura (Japan)*
- PA7-3** FAST TECHNETIUM EIGENCOLLOID DETERMINATION: PREPARATIVE CPC  
COMBINED WITH SUSPENSION LIQUID SCINTILLATION.  
*E. Breynaert, A. Maes (Belgium)*
- PA7-4** REDOX PROCESS AT SOLID-LIQUID INTERFACES: STUDIES WITH THIN LAYERS OF  
GREEN RUSTS ELECTRODEPOSITED ON INERT SUBSTRATES  
*S. Peulon, Y. Taghdai, F. Mercier, N. Barré, L. Legrand, A. Chaussé (France)*







**PB2****DIFFUSION AND OTHER MIGRATION PROCESSES**

- PB2-1** DIFFUSION AND RETENTION OF SODIUM AND STRONTIUM IN OPALINUS CLAY: COMPARISON OF SORPTION DATA FROM BATCH AND DIFFUSION MEASUREMENTS, AND GEOCHEMICAL CALCULATIONS  
*L.R. Van Loon, B. Baeyens, M.H. Bradbury (Switzerland)*
- PB2-2** STUDY OF THE REVERSIBILITY OF IODIDE SORPTION TOWARDS ARGILLACEOUS ROCKS USING THE RADIAL DIFFUSION METHOD  
*S. Savoye, J.L. Michelot, C. Wittebroodt (France)*
- PB2-3** LARGE SCALE LABORATORY DIFFUSION EXPERIMENTS IN CLAY ROCKS.  
*M. García-Gutiérrez, J.L. Cormenzana, T. Missana, M. Mingarro, P.L. Martín (Spain)*
- PB2-4** DIFFUSION OF HUMIC COLLOIDS IN COMPACTED CLAY AND THE INFLUENCE ON URANIUM MIGRATION  
*J. Mibus, S. Sachs (Germany)*
- PB2-5** RADIATION MEASUREMENT AND INVERSE ANALYSIS TECHNIQUES APPLIED ON THE DETERMINATION OF THE APPARENT MASS DIFFUSION COEFFICIENT FOR DIVERSE CONTAMINANTS AND SOIL SAMPLES  
*D.V.F.M. Rey Silva, A.P. Oliveira, J.F. Macacini, N.C. da Silva, M. Cipriani, A.L. Quinelato (Brazil)*
- PB2-6** TRANSPORT PROPERTIES OF  $^{36}\text{Cl}$ , HTO AND  $^{22}\text{Na}$  IN CALLOVO-OXFORDIAN CLAY RELATED TO THE IONIC STRENGTH IN THE SOLUTION  
*F. Goutelard, C. Chollet, J. Page (France)*
- PB2-7** SENSITIVITY ANALYSIS OF AN EXPERIMENTAL METHODOLOGY TO DETERMINE RADIONUCLIDE DIFFUSION COEFFICIENTS IN GRANITE  
*U. Alonso, T. Missana, A. Patelli, M. García-Gutierrez, V. Rigato (Spain, Italy)*
- PB2-8** DETERMINATION OF DIFFUSION AND SORPTION PROPERTIES OF GRANITIC ROCK  
*P. Hölttä, A. Poteri, M. Siitari-Kauppi, J. Kyllönen (Finland)*
- PB2-9** SORPTION AND DIFFUSION OF SELENIUM ON CRUSHED GRANITE  
*Y.-L. Jan, Y.-Y. Li, M.-H. Li, S.-C. Tsai, Y.-Y. Wei, S.-P. Teng, C.-N. Hsu (Taiwan)*
- PB2-10** CESIUM DIFFUSION IN BURE MUDROCK: EFFECT OF CESIUM SORPTION AND OF THE SURFACE STRUCTURE OF THE CLAY.  
*T. Melkior, S. Motellier, S. Yahiaoui (France)*
- PB2-11** CHARACTERISATION OF IN SITU DIFFUSION-ACCESSIBLE MATRIX POROSITY AT THE GRIMSEL TEST SITE, SWITZERLAND  
*K. Ota, C. Biggin, A. Möri (Japan, Switzerland)*
- PB2-12** ACTIVATION ENERGIES FOR DIFFUSION OF IODINE AND CESIUM IN COMPACTED SODIUM SMECTITE  
*H. Sato (Japan)*
- PB2-13** CHARACTERISING LOW PERMEABLE GRANITIC ROCK FROM MICRO TO CENTIMETRIC SCALES: X-RAY MICROCOMPUTER TOMOGRAPHY, CONFOCAL LASER MICROSCOPY AND  $^{14}\text{C}$ -PMMA METHOD  
*T. Lähdemäki, M. Myllys, T. Turpeinen, A. Jäsperg, J. Timonen, M. Kelokaski, M. Siitari-Kauppi, M. Montoto (Finland, Spain)*
- PB2-14** STUDY OF THE MIGRATION OF THE CHLORINE ACTIVATION PRODUCT IN  $\text{UO}_2$ . THERMAL AND  $\alpha$ -INDUCED IRRADIATION EFFECTS  
*Y. Pison, N. Moncoffre, N. Toulhoat, A. Chevarier, S. Gavarini, L. Raimbault, C. Esnouf, A. Scheidegger (France)*
- PB2-15** DIRECT SIMULATION OF HETEROGENEOUS DIFFUSION AND INVERSION PROCEDURE APPLIED TO AN OUT-DIFFUSION EXPERIMENT. TEST CASE OF PALMOTTU GRANITE  
*P. Sardini, F. Delay, K.H. Hellmuth, M. Siitari-Kauppi, M. Cassiaux (France, Finland)*

- PB2-16** 11-YEAR FIELD STUDY OF Pu MIGRATION FROM Pu III, IV, AND VI SOURCES  
*D.I. Kaplan, D.I. Demirkanli, L. Gumapas, B.A. Powell, R.A. Fjeld, F.J. Molz, S.M. Serkiz (USA)*
- PB2-17** URANIUM TRANSPORT UNDER VARIABLE GROUNDWATER CONDITIONS IN COLUMNS PACKED WITH SEDIMENTS FROM THE NATURITA FIELD SITE, CO, U.S.A.; EXPERIMENTS AND MODELS  
*M. Kohler, G. P. Curtis, J. A. Davis (USA)*
- PB2-18** REACTIVE TRANSPORT MODELING OF CESIUM IN CRUSHED GRANITE AT LOW FLOW RATE  
*M.-H. Li, T.-H. Wang, Y.-L. Jan, S.-P. Teng, C.-N. Hsu (Taiwan)*
- PB2-19** U ISOTOPES IN CHARACTERISING GROUNDWATER SYSTEM  
*J. Suksi (Finland)*
- PB2-20** MODELING THE FATE TRANSPORT OF CESIUM IN CRUSHED GRANITE  
*C.-B. Lee, Y.-M. Kuo, M.-H. Li, H.-P. Cheng, S.-P. Teng, C.-N. Hsu (Taiwan)*

**PB3** **COLLOID MIGRATION**

- PB3-1** FILTRATION STUDIES OF DIFFERENT SIZED COLLOIDS IN WELL-CHARACTERISED POROUS MEMBRANES  
*U. Alonso, T. Missana, A. Patelli, V. Rigato (Spain, Italy)*
- PB3-2** THE ROLE OF NATURAL ORGANIC MATTER IN THE MIGRATION BEHAVIOUR OF AMERICIUM IN THE BOOM CLAY - PART II: ANALYSIS OF MIGRATION EXPERIMENTS  
*T. Hicks, D. Bennett, N. Maes, L. Wang, P. Warwick, T. Hall, G. Walker, A. Dierckx (UK, Belgium)*
- PB3-3** THE ROLE OF NATURAL ORGANIC MATTER IN THE MIGRATION BEHAVIOUR OF AMERICIUM IN THE BOOM CLAY - PART I: MIGRATION EXPERIMENTS  
*N. Maes, L. Wang, T. Hicks, D. Bennett, P. Warwick, T. Hall, G. Walker, A. Dierckx (Belgium, UK)*
- PB3-4** MODELING OF COLLOID MIGRATION ASSOCIATED WITH ACTINIDES IN FRACTURED GEOLOGIC MEDIA CONSIDERING INTERACTION KINETICS  
*S. Nagasaki, S. Tanaka (Japan)*
- PB3-5** COLLOID AND RADIONUCLIDE RETENTION MECHANISMS IN FRACTURED ROCK UNDER NEAR-NATURAL FLOW CONDITIONS  
*A. Delos, T. Schäfer, H. Geckeis, J. Guimera, J. Carrera, T. Fanghänel (Spain, Germany)*
- PB3-6** MIGRATION OF PLUTONIUM IN A SANDY AQUIFER SAMPLE RICH IN HUMIC SUBSTANCES  
*A. Seibert, C.M. Marquardt, Th. Schäfer, Th. Fanghänel (Germany)*

**PB4** **EFFECTS OF BIOLOGICAL AND ORGANIC MATERIALS**

- PB4-1** THE ROLE OF HUMIC SUBSTANCES ON URANIUM-IV SORPTION IN CLAYEY SEDIMENTS  
*A. Abdelouas, B. Grambow, M. Azouazi, U. Noseck (France, Germany)*
- PB4-2** A NEW METHOD TO RADIOLABEL FULVIC ACIDS WITH TRITIUM  
*R. M. Tinnacher, B. D. Honeyman, J. A. Leenheer (USA)*
- PB4-3** CHARACTERIZATION OF THE BINDING MECHANISMS OF URANIUM TO DIFFERENT ISOLATED BACTERIA IN FUNCTION OF pH  
*M. Merroun, M. Nedelkova, J. Raff, A. Rossberg, C. Hennig, A.C. Scheinost, S. Selenska-Pobell (Germany)*

- PB4-4** ACCUMULATION BEHAVIOR OF Ce(III) BY Mn(II) OXIDIZING BACTERIA  
*T. Ohnuki, T. Ozaki, T. Yoshida, T. Nankawa, T. Sakai, A.J. Francis (Japan, USA)*
- PB4-5** IODINATION OF THE HUMIC SAMPLES FROM HUPA PROJECT  
*P. Reiller, F. Mercier-Bion, N. Gimenez, N. Barré, F. Miserque (France)*
- PB4-6** BIOREDUCTION OF PLUTONYL AND NEPTUNYL BY SHEWANELLA ALGA  
*D. T. Reed, B. E. Rittmann, W. Songkasiri, J. F. Lucchini (USA, Thailand)*
- PB4-7** BIOTRANSFORMATION OF PLUTONIUM COMPLEXED WITH CITRIC ACID  
*A.J. Francis, C.J. Dodge, J.B. Gillow (USA)*
- PB4-8** INFLUENCE OF HUMIC ACIDS ON THE RETENTION OF PLUTONIUM IN SOIL  
*L. Genot, H. Michel, G. Barci-Funel (France)*
- PB4-9** Np(V) SORPTION BY GOETHITE AND HEMATITE IN THE PRESENCE OF HUMIC ACID  
*A.B. Khasanova, St.N. Kalmykov, N.S. Shcherbina, I.V. Perminova, S.B. Clark (Russia, USA)*
- PB4-10** HEXAVALENT URANIUM REDUCTION FROM SOLID PHASE BY THERMOPHILIC BACTERIUM THERMOTERRABACTERIUM FERRIREDCENS  
*T.V. Khijniak, A.I. Slobodkin, V. Coker, E.A. Bonch-Osmolovskaya, N.N. Medvedeva-Lyalikova, N.-K. Birkeland, J.R. Lloyd (Russia, UK, Norway)*
- PB4-11** OBSERVATION OF COLLOIDS COATED BY HUMIC ACID AND ITS EFFECT ON RADIONUCLIDE SORPTION  
*S.Y. Lee, M.H. Baik, W.J. Cho, P.S. Hahn (Korea)*
- PB4-12** MECHANISMS FOR THE REDUCTION OF ACTINIDE IONS BY GEOBACTER SULFURREDCENS  
*J. C. Renshaw, I. May, F. R. Livens, J. R. Lloyd (UK)*
- PB4-13** THE POTENTIAL IMPACT OF MICROBIAL Fe(III) REDUCTION ON SUBSURFACE U(VI) MOBILITY AT A LOW LEVEL RADIOACTIVE WASTE STORAGE SITE  
*M. J. Wilkins, F. R. Livens, D. J. Vaughan, I. Beadle, J. S. Small, J. R. Lloyd (UK)*
- PB4-14** LABELLING OF NATURAL HUMIC SUBSTANCES WITH <sup>14</sup>C AND THEIR USE IN ADSORPTION STUDIES  
*A. Mansel, H. Kupsch (Germany)*
- PB4-15** EFFECT OF Eu(III) ON THE DEGRADATION OF MALIC ACID BY PSEUDOMONAS FLUORESCENS  
*T. Nankawa, Y. Suzuki, T. Ozaki, T. Ohnuki, A.J. Francis (Japan, USA)*
- PB4-16** INTERACTIONS OF ACTINIDES AND RARE EARTH ELEMENTS WITH BACTERIA IN THE PRESENCE OF SIDEROPHORE DESFERRIOXAMINE  
*T. Yoshida, T. Ozaki, T. Ohnuki, A.J. Francis (Japan, USA)*

## **PB5** **FIELD AND LARGE SCALE EXPERIMENTS**

- PB5-1** DIFFUSION OF HTO, Br<sup>-</sup>, I<sup>-</sup>, Cs<sup>+</sup>, <sup>85</sup>Sr<sup>2+</sup>, <sup>60</sup>Co<sup>2+</sup> AND Eu<sup>3+</sup> IN A CLAY FORMATION: FIRST RESULTS FROM AN IN-SITU EXPERIMENT IN OPALINUS CLAY  
*P. Wersin, Th. Gimmi, L. Van Loon, J. M. Soler, S. Dewonck, J. Eikenberg, B. Baeyens, P. Hernán (Switzerland, Spain, France)*
- PB5-2** PREDICTIVE MODELLING OF A LONG-TERM DIFFUSION EXPERIMENT AT THE GRIMSEL TEST SITE, SWITZERLAND  
*C. Biggin, K. Ota, J. Soler, A. Laciok, A. Möri, M. Sittari-Kauppi, I. Blechschmidt (Switzerland, Japan, Spain, Czech Republic, Finland)*
- PB5-3** DISTRIBUTION AND MIGRATION OF RADIONUCLIDES IN HOST ROCK SURROUNDING A SHALLOW GROUND BURIAL OF VITRIFIED RADIOACTIVE WASTE  
*S.A. Dmitriev, A.S. Barinov, G.A. Varlakova, Y.V. Sukhova, I.V. Startceva, N.A. Titaeva, M.I. Ojovan (Russia, UK)*

- PB5-4** LARGE INTACT COLUMNS - USEFUL FOR STUDIES OF ACTINIDE MIGRATION?  
*S.L.S. Stipp, L. Karlby, H. Milter, P. Engesgaard, P.R. Jørgensen (Denmark)*
- PB5-5** DEVELOPMENT OF MEASUREMENT SYSTEM FOR THE VERIFICATION OF THE PERFORMANCE ASSESSMENT OF H.L.W. REPOSITORY  
*T. Toida, T. Ohe, M. Nishigaki, M. Sato, M. Tanaka, S. Nagai, T. Suzuki (Japan)*
- PB5-6** FIELD SORPTION EXPERIMENTS AT RADON FACILITY  
*A.S. Barinov, L.B. Prozorov, V.V. Martyanov, A.V. Guskov (Russia)*
- PB5-7** <sup>90</sup>Sr MIGRATION FROM THE LOW-LEVEL WASTE BURIAL TO A SAND AQUIFER AT THE CHERNOBYL NPP SITE: HYDROGEOLOGICAL, GEOSTATISTICAL AND GEOCHEMICAL MODEL INTEGRATION AND CALIBRATION  
*D.Bugai, L.Dewiere, V.Kashparov, C.Ardois, D.Stammose (Ukraine, France)*
- PB5-8** IRON(OXY/HYDR)OXIDES IN FRACTURES AT ÄSPÖ, SWEDEN  
*B.C. Christiansen, K. Dideriksen, E-L. Tullborg, C.Frandsen, T. Balic-Zunic, J.A. Baker, S. Mørup, S.L.S. Stipp (Denmark, Sweden, New Zealand)*
- PB5-9** BLOCK-SCALE LABORATORY EXPERIMENTS OF SOLUTE TRANSPORT THROUGH A NATURAL ROCK FRACTURE  
*P. Hölttä, A. Poteri (Finland)*
- PB5-10** IN SITU STUDY OF RADIONUCLIDE MIGRATION AND DIFFUSION PATHS IN FRACTURED ROCKS BY  $\beta/\gamma$ -AUTORADIOGRAPHY AND COLLIMATED  $\gamma$ -SPECTROMETRY  
*A. Möri, U. Mäder, C. Biggin, M. Rüthi (Switzerland)*
- PB5-11** EVALUATION OF DAMAGE-INDUCED DIFFUSION PARAMETERS IN TOURNEMIRE ARGILLITE USING AN IN-SITU EXPERIMENT  
*S. Savoye, J.L. Michelot, C. Wittebroodt, J.M. Matray (France)*
- PB5-12** VISUALISATION OF CONDUCTIVE PORE SPACE BY <sup>14</sup>C-PMMA IMPREGNATION - DEVELOPMENT WORK FOR IN SITU STUDIES  
*M. Kelokaski, T. Lähdemäki, A. Möri, C. Biggin, W. Kickmaier, K-H. Hellmuth, M. Siitari-Kauppi (Finland, Switzerland)*
- PB5-13** EXPERIENCE IN LONG TERM STORAGE OF CEMENTED RADIOACTIVE WASTES IN A MOUND TYPE REPOSITORY OF MOSCOW SIA "RADON"  
*I.A. Sobolev, S.A. Dmitriev, A.S. Barinov, G.A. Varlakova, Z.I. Golubeva, I.V. Startceva, M.I. Ojovan (Russia, UK)*
- PB5-14** NUMERICAL MODEL OF DI-B IN SITU DIFFUSION EXPERIMENT IN THE OPALINUS CLAY FORMATION  
*J. Samper, A. Yllera, J. Molinero, J. Soler, P. Hernán, A. Naves, C. Yang, J.C. Mayor, J. Astudillo (Spain)*
- PB5-15** CFM - A LONG TERM REPOSITORY RELEVANT IN-SITU EXPERIMENT ON COLLOID AND RADIONUCLIDE MIGRATION, GRIMSEL TEST SITE, PHASE VI  
*I. Blechschmidt, W.R. Alexander, M. Decombarieu, A. Moeri, H. Geckeis, K. Iijima (Switzerland, France, Germany, Japan)*

## **PB6** NATURAL ANALOGUES

- PB6-1** SORPTION-DESORPTION OF CESIUM ON-FROM ILLITE AND ILLITE COATED WITH PETROLEUM WITH REFERENCE TO OKLO NATURAL FISSION REACTORS  
*Gy. Szabó, J. Gucci, M. Del Nero, F. Gauthier-Lafaye (Hungary, France)*
- PB6-2** INCORPORATION OF REE INTO ZIRCON BY ALTERATION EFFECTS: AN EXAMPLE OF METAMICTIZED ZIRCON FROM BIDOUDOUMA, GABON  
*K. Horie, H. Hidaka, F. Gauthier-Lafaye (Japan, France)*

- PB6-3** LEAD ISOTOPIIC EVIDENCE FOR SELECTIVE UPTAKE OF RADIUM IN ILLITE  
*H. Hidaka, K. Horie, F. Gauthier-Lafaye (Japan, France)*
- PB6-4** DIFFUSION PROCESSES OF URANIUM IN A NATURAL ARGILLACEOUS SYSTEM  
*D. Schönwiese, U. Noseck, J. Suksi, Th. Brasser (Germany, Finland)*
- PB6-5** FATE OF THE EPSILON PHASE IN THE OKLO NATURAL REACTORS  
*S. Utsunomiya, R.C. Ewing (USA)*
- PB6-6** FORMATION OF BIOGENIC IRON-OXIDE AGGREGATION AS AN ANALOGUE OF NEAR-FIELD REDOX REACTION AND RELEVANT ELEMENTAL MIGRATION  
*H.Yoshida, K.Yamamoto, Y.Murakami, K.Matsuoka (Japan)*
- PB6-7** GEOCHEMICAL BEHAVIOR OF URANIUM IN A NATURAL ARGILLACEOUS SYSTEM AT RUPRECHTOV SITE  
*A. Laciok, U. Noseck, Th. Brasser, V. Havlova, M. Hercik (Czech Republic, Germany)*
- PB6-8** A STUDY OF ELEMENT MIGRATION IN THE MAQARIN SITE (JORDAN) BY THE MEANS OF COLUMN EXPERIMENTS : I. MAJOR ELEMENTS  
*L. Trotignon, J. Rose, H. Houry, C. Bulle, N. Crouzet, P. Bienvenu (France, Jordan)*
- PB6-9** A STUDY OF ELEMENT MIGRATION IN THE MAQARIN SITE (JORDAN) BY THE MEANS OF COLUMN EXPERIMENTS : II. TRACE ELEMENTS (Cr, Se, Mo, Re)  
*L. Trotignon, J. Rose, H. Houry, P. Trocellier, F. Mercier, P. Bienvenu, O. Provitina, L. Raimbault (France, Jordan)*

## **PC1 DATA SELECTION AND EVALUATION**

- PC1-1** TOWARDS A SPECTROSCOPIC STANDARD DATABASE FOR Pu IN REPOSITORY ENVIRONMENTS  
*M. Amme (EU)*
- PC1-2** REVIEW ON CATION EXCHANGE SELECTIVITY COEFFICIENTS FOR MX-80 BENTONITE  
*C.Domènech, D.Arcos, L.Duro, P.Sellin (Spain, Sweden)*
- PC1-3** WEBSITE "THERMODYNAMICS OF NATURAL PROCESSES": RADIONUCLIDES AND TOXIC ELEMENTS  
*I.L. Khodakovsky, E.I. Sergeeva, O.A. Devina, V.N. Victorov, E.A. Denisova (Russia)*
- PC1-4** DERIVATION OF SELF-CONSISTENT SORPTION AND DIFFUSION PARAMETERS AND THEIR UNCERTAINTIES FOR COMPACTED MX-80 BENTONITE  
*M. Ochs, C. Talerico, P. Sellin, A. Hedin (Switzerland, Sweden)*

## **PC2 COUPLING CHEMISTRY AND TRANSPORT**

- PC2-1** INFLUENCE OF ALPHA RADIOLYSIS OF WATER ON UO<sub>2</sub> MATRIX ALTERATION: CHEMICAL/TRANSPORT MODEL  
*A. Poulesquen, C. Jégou (France)*
- PC2-2** MODELLING IRON-CLAY INTERACTIONS IN DEEP GEOLOGICAL DISPOSAL CONDITIONS  
*O. Bildstein, M. Perronnet, M. Jullien (France)*
- PC2-3** MODELING COUPLED THERMAL-HYDROLOGICAL-CHEMICAL PROCESSES AT YUCCA MOUNTAIN, NEVADA: FLOW FOCUSING AND SEEPAGE INTO DRIFTS  
*S. Mukhopadhyay, E. Sonnenthal, N. Spycher (USA)*

- PC2-4** SIMULATION WITH PHAST OF THE POREWATER CHEMISTRY EXPERIMENT RESULTS (MONT TERRI URL, SWITZERLAND), INCLUDING TRANSPORT, THERMODYNAMICS, KINETICS, AND BIOLOGICAL ACTIVITY.  
*C. Tournassat, E. Gaucher, F.J. Pearson, S. Mettler, P. Wersin (France, USA, Switzerland)*
- PC2-5** MODELING COUPLED THERMAL, FLOW, TRANSPORT AND GEOCHEMICAL PROCESSES CONTROLLING NEAR FIELD LONG-TERM EVOLUTION  
*W. Zhou, R. Arthur, T. Xu, K. Pruess (USA)*
- PC2-6** SIMULATION OF CLOGGING EFFECTS AT THE INTERFACE BETWEEN MX80-CLAY AND CONCRETE IN A DEEP RADIOACTIVE WASTE REPOSITORY  
*V. Lagneau, J. van der Lee (France)*
- PC2-7** UNCERTAINTY IN REACTIVE TRANSPORT GEOCHEMICAL MODELLING  
*A. Ödegaard-Jensen, C. Ekberg (Sweden)*
- PC2-8** APPLYING MECHANISTIC MODELING AT THE FIELD SCALE: RADIONUCLIDE TRANSPORT AT THE NEVADA TEST SITE  
*M. Zavarin, M.R. Johnson, S.K. Roberts, R. Pletcher, Q. Hu, A.B. Kersting, E. Ramon, J. Walensky (USA)*
- PC2-9** INTERCOMPARISON OF REACTIVE TRANSPORT MODELS APPLIED TO DEGRADATION OF A CONCRETE / CLAY INTERFACE  
*A. Burnol, P. Blanc, C. Tournassat, A. Lassin, E.C. Gaucher (France)*
- PC2-10** PERFORMANCE ASSESSMENT OF CEM-I AND CEM-V CONCRETE ENGINEERED BARRIERS IN A CLAYEY GEOLOGICAL MEDIUM  
*L. Trotignon, H. Peycelon, X. Bourbon (France)*
- PC2-11** STRONTIUM-90 MIGRATION IN HANFORD SEDIMENTS, USA  
*C.I. Steefel, S.A. Carroll, J.M. Zachara, L. Yang, S.B. Yabusaki, S. Roberts (USA)*

### **PC3 DEVELOPMENT AND APPLICATION OF MODELS**

- PC3-1** PREDICTION OF CATION RETENTION ON CLAYEY ROCK USING ION-EXCHANGE MODEL: APPLICATION TO Cs<sup>+</sup> RETENTION ON CALLOVO-OXFORDIAN ARGILLITE.  
*C. Beaucaire, C. Latrille, J. Ly, E. Tevissen (France)*
- PC3-2** RECENT PROGRESS IN SORPTION MECHANISMS AND MODELS  
*M. Fédoroff, G. Lefèvre (France)*
- PC3-3** 2D TRANSPORT MODELING OF TRITIUM-HELIUM IN AN AQUIFER WITH ALLIANCES  
*A. Dimier, C.A.J. Appelo (France, the Netherlands)*
- PC3-4** FLOW AND TRANSPORT PROPERTIES OF A 200 METERS MULTI SCALE FRACTURED BLOCK AT THE ÄSPÖ (SWEDEN) UNDERGROUND LABORATORY  
*C. Grenier, G. Bernard-Michel, A. Fournio, H. Benaderrahmane (France)*
- PC3-5** STUDY ON TRANSITION BEHAVIOR OF CORROSION RELATED ENVIRONMENT NEAR DISPOSAL SITE  
*K. Masuda, T. Nakanishi, O. Kato, R. Wada (Japan)*
- PC3-6** DUAL CONTINUUM MODELS OF FULLY COUPLED NON-ISOTHERMAL MULTIPHASE FLOW AND REACTIVE TRANSPORT IN POROUS MEDIA  
*L. Zheng, J. Samper (Spain)*
- PC3-7** PARAMETRIC STUDY OF THE SORPTION OF Cs(I) AND Sr(II) ON MIXTURE OF BENTONITE AND MAGNETITE USING SCM + IEXM  
*H. Filipiská, K. Štamberg (Czech Republic)*

- PC3-8** BEHAVIOUR OF URANIUM AND THORIUM ISOTOPES IN SOILS OF THE BORÉON AREA, MERCANTOUR MASSIF (SE FRANCE). PROBLEM OF WEATHERING RATE MODELLING.  
*S. Rezzoug, F. Fernex, H. Michel, G.Barci-Funel, V. Barci (France)*

## **PC4 MODEL VALIDATION**

- PC4-1** RADIOLYTIC MODELLING OF SPENT FUEL OXIDATIVE DISSOLUTION MECHANISM. DEVELOPMENT OF THE MODEL AND TESTING WITH EXPERIMENTAL DATA  
*J. Merino, E. Cera, J. Bruno, I. Casas, F. Clarens, J. Giménez, J. de Pablo, M. Rovira, J. Quiñones, A. Martínez-Esparza (Spain)*
- PC4-2** MODELLING OF <sup>90</sup>Sr IN-SITU MIGRATION: MODELS COMPARISON AND COUPLED SOIL CHARACTERISATION  
*E. Piault, A. Cartalade, C. Beaucaire, J.M. Fernandez, F. van Dorpe (France, New-Caledonia)*
- PC4-3** VALIDATION AND USE OF A REACTIVE TRANSPORT CODE IN POROUS MEDIA  
*M. Descostes, C. Mügler, Ph. Montarnal, A. Dimier, J. Colin (France)*
- PC4-4** VALIDATION OF REACTIVE TRANSPORT CODES: A BENCHMARK STUDY FOR THE MIGRATION OF URANYL THROUGH A QUARTZ COLUMN.  
*Ch. Tiffreau, O. Bildstein, J. Lützenkirchen, J. Camai (France, Germany, Spain)*

## **PC5 APPLICATION OF MODELS TO PERFORMANCE ASSESSMENT**

- PC5-1** CHANGES OF THE GROUNDWATER COMPOSITION IN FRACTURED ROCKS OF LOW PERMEABILITY AS A CONSEQUENCE OF DEGLACIATION  
*A. Delos, L. Duro, J. Guimera, J. Bruno, I. Puigdomenech (Spain, Sweden)*
- PC5-2** EFFECT OF EXCAVATION-DAMAGED ZONE ON GAS MIGRATION IN A KBS-3H TYPE REPOSITORY AT OLKILUOTO  
*J. Autio, P. Gribi, L. Johnson, P. Marschall (Finland, Switzerland)*
- PC5-3** ASSESSMENT OF RADIONUCLIDES CONFINEMENT FOR R7T7 AND AVM FRENCH NUCLEAR GLASSES  
*F. Angeli, I. Ribet, S. Gin (France)*
- PC5-4** UNCERTAINTY IN RECOMMENDING  $K_D$  VALUES FOR PERFORMANCE ASSESSMENT IN GRANITIC ROCK ENVIRONMENTS - AN ANALYSIS OF RECENT LITERATURE DATA  
*J. N. Crawford, I. Neretnieks, L. Moreno (Sweden)*
- PC5-5** ASSESSING RADIONUCLIDE RELEASE AND MIGRATION DURING DEEP GEOLOGICAL DISPOSAL OF BITUMINISED WASTE : THE COLONBO MODEL  
*C. Tiffreau, J. Sercombe, F. Adenot, C. Santucci (France)*

## **PES INTERNATIONAL RESEARCH ACTIVITIES**

- PES-1** EUROPEAN LABORATORIES FOR ACTINIDE RESEARCH: THE ACTINET POOLED FACILITIES  
*H. Geckeis, D. Guillaneux, T. Wiss, F. Joppen, A. Scheinost, G. Geipel, A. Scheidegger, P. Chaix (Germany, France, EU, Belgium)*
- PES-2** REVIEW OF THE FRENCH ENVIRONMENTAL NUCLEAR TOXICOLOGY PROGRAMME  
*J.J.Leguay, M.T.Ménager, E.Ansoborlo (France)*



- PES-3** THE OECD/NEA TDB REVIEW ON NICKEL  
*H. Gamsjäger, J. Bugajski, T. Gajda, R. J. Lemire, W. Preis (Austria, Hungary, Canada)*
- PES-4** THE OECD/NEA TDB REVIEW OF SELECTED ORGANIC LIGANDS  
*W. Hummel, G. Anderegg, I. Puigdomènech, L. Rao, O. Tochiyama (Switzerland, Sweden, USA, Japan)*
- PES-5** DEVELOPMENT AND APPLICATIONS OF REACTIVE TRANSPORT MODELS IN THE FRAMEWORK OF THE REACTIVE TRANSPORT CONSORTIUM (PGT)  
*J. van der Lee, R. Barbarulo, H. Catalette, L. De Windt, V. Lagneau, D. Pellegrini, E. Pili, L. Trotignon (France)*
- PES-6** USE OF THERMODYNAMIC SORPTION MODELS TO DERIVE RADIONUCLIDE  $K_D$  VALUES FOR PERFORMANCE ASSESSMENT: SELECTED RESULTS AND RECOMMENDATIONS OF THE NEA SORPTION PROJECT  
*M. Ochs, J.A. Davis, M. Olin, T.E. Payne, C.J. Tweed, M.M. Askarieh, S. Altmann (Switzerland, Finland, USA, Australia, UK, France)*
- PES-7** INTEGRATED PROJECT "FUNDAMENTAL PROCESSES OF RADIONUCLIDE MIGRATION (FUNMIG), WITHIN EC 6th FRAMEWORK PROGRAMME  
*G. Buckau (Germany)*
- PES-8** THE OECD/NEA TDB REVIEW OF ZIRCONIUM  
*P.L. Brown, B. Grambow, E. Curti (Australia, France, Switzerland)*
- PES-9** THE OECD/NEA TDB REVIEW ON SELENIUM  
*Å. Olin, B. Nörling, L-O. Öhman, E. Osadchii, E. Rosén (Sweden, Russia)*
- PES-10** THE THIRD PHASE OF THE OECD/NEA TDB PROJECT: TDB III  
*F. J. Mompeán, M. Illemassène, J. Perrone on behalf of the NEA TDB III Executive Group (France)*

## WEDNESDAY (21. September)

### SESSION 11 **B2-DIFFUSION AND OTHER MIGRATION PROCESSES**

*Chair: U. Berner (Switzerland) and C.I. Steefel (USA)*

- 8:30 IN-SITU DIFFUSION EXPERIMENTS AT MONT TERRI: MODELING ASPECTS **B2-1**  
*J. Soler invited (Spain)*
- 9:15 CATION DIFFUSION IN HIGHLY COMPACTED MONTMORILLONITE: VARIATION OF SAMPLE THICKNESS AND IONIC STRENGTH **B2-2**  
*M.A. Glaus, A. Jakob, W. Müller, L.R. Van Loon, A. Yaroshchuk (Switzerland)*
- 9:40 HTO AND  $^{125}\text{I}$  DIFFUSION IN CALLOVO-OXFORDIAN ARGILLITES AND OXFORDIAN LIMESTONES **B2-3**  
*M. Descostes, V. Blin, F. Bazer-Bachi, P. Meier, B. Grenut, E. Tevissen, D. Coelho (France)*
- 10:05 INFLUENCE OF CLAY ALTERATION ON MIGRATION BEHAVIOR OF CESIUM IN COMPACTED BENTONITE IN CONTACT WITH SALINE WATER AT HIGH TEMPERATURE **B2-4**  
*S. Suzuki, K. Suzuki (Japan)*



10:30 DIELECTRIC SPECTROSCOPY AS A PROBE FOR THERMODYNAMIC AND DYNAMIC PROPERTIES OF COMPACTED SMECTITES **B2-5**  
*B. Rotenberg, A. Cadene, N. Malikova, J.-F. Dufèvre, S. Durand-Vidal, P. Turq, J.-C. Badot (France)*

10:55 BREAK

## **SESSION 12** **A5-SOLID-WATER INTERFACE REACTIONS**

*Chair: C. Poinssot (France) and D.L. Clark (USA)*

11:15 UPTAKE OF TRIVALENT ACTINIDES (Cm(III)) BY HARDENED CEMENT PASTE: A TIME-RESOLVED LASER FLUORESCENCE SPECTROSCOPY (TRLFS) STUDY **A5-5**  
*T. Stumpf, J. Tits, Th. Fanghänel, C. Walther, Th. Rabung, E. Wieland (Germany, Switzerland)*

11:40 RADIUM BINDING BY CALCIUM SILICATE HYDRATES AND HARDENED CEMENT PASTE **A5-6**  
*J. Tits, K. Iijima, E. Wieland, G. Kamei (Switzerland, Japan)*

12:05 CHARACTERISATION OF THERMALLY ALTERED CEMENT PASTES: INFLUENCE ON SELENIUM SORPTION. **A5-7**  
*N. Macé, C. Landesman, I. Pointeau, B. Grambow, E. Giffaut (France)*

12:30 LUNCH BREAK

13:30 **EXCURSION**

## **THURSDAY (22. September)**

## **SESSION 13** **A5-SOLID-WATER INTERFACE REACTIONS**

*Chair: J.A. Davis (USA) and S. Tanaka (Japan)*

8:30 DFT STUDIES OF FLUID-MINERALS INTERACTIONS AT THE MOLECULAR LEVEL: EXAMPLES AND PERSPECTIVES **A5-8**  
*H. Toulhoat invited (France)*

9:15 THE LOCAL STRUCTURE OF U(VI)-FERRIHYDRITE SORPTION COMPLEXES REVISITED: EXAFS SPECTROSCOPY AND MONTE-CARLO SIMULATIONS **A5-9**  
*A. Rossberg, K.-U. Ulrich, A. C. Scheinost (Germany)*

9:40 URANYL ION SORPTION MECHANISMS ON TITANIUM OXIDE : A MULTI-SCALE APPROACH **A5-10**  
*J. Vandenborre, R. Drot, E. Simoni, W. Dong, J. Du, M. Dossot, B. Humbert, J.-J. Ehrhardt (France)*

10:05 BREAK

## SESSION 14

## A6/B3-COLLOID FORMATION AND MIGRATION

Chair: *H. Nitsche (USA) and V. Moulin (France)*

- 10:25 INTERACTION OF Eu, Th AND U WITH BENTONITE COLLOIDS IN PRESENCE OF HUMIC ACID: A FLOW-FIELD FLOW FRACTIONATION STUDY **A6-1**  
*M. Bouby, H. Geckeis, Th. Schäfer, S. Mihai, Th. Fanghänel (Germany, Romania)*
- 10:50 EFFECT OF COLLOIDS ON RADIONUCLIDE MIGRATION IN OXIC AND ANOXIC CONDITIONS **B3-1**  
*St.N. Kalmykov, A.P. Novikov, R.C. Ewing, S. Utsunomiya (Russia, USA)*
- 11:15 COLLOID-FACILITATED TRANSPORT OF PLUTONIUM IN FRACTURED VOLCANIC TUFF AND CARBONATE CORES **B3-2**  
*A.B. Kersting, M. Zavarin, J. Walensky, S. Roberts, M. R. Johnson, P. Zhao, D. Phinney, E. Ramon (USA)*
- 11:40 COLLOIDS FORMATION VERSUS COMPLEXATION IN RADIONUCLIDES NATURAL ORGANIC MATTER INTERACTION STUDIES: THE CASE OF BOOM CLAY **A6-2**  
*L. Wang, N. Maes, J. van der Lee, G. Delécaut (Belgium)*
- 12:05 FORMATION OF AQUATIC ACTINIDE(IV) COLLOID AND STABILIZATION VIA INTERACTION WITH An(III)/Ln(III) **A6-3**  
*J.I. Yun, M.A. Kim, P.J. Panak, J.I. Kim, Th. Fanghänel (Germany)*
- 12:30 LUNCH BREAK

## SESSION 15

## A3-COMPLEXATION WITH INORGANIC AND ORGANIC LIGANDS

Chair: *T. Kimura (Japan) and J. Fuger (Belgium)*

- 14:00 ACTINIDE SPECTROSCOPY AND ITS ROLE IN IDENTIFYING ELECTRON STATES **A3-1**  
*G. Lander invited (EU)*
- 14:45 INVESTIGATION OF INTERACTIONS BETWEEN LANTHANIDE IONS AND HUMIC SUBSTANCES USING TIME-RESOLVED LUMINESCENCE SPECTROSCOPY AND STOPPED-FLOW-FLUORESCENCE MEASUREMENTS **A3-2**  
*S. Eidner, T. Krüger, M.U. Kumke (Germany)*
- 15:10 SPECIATION OF RADIONUCLIDES WITH BIOLIGANDS USING ELECTROSPRAY MASS SPECTROMETRY (ES-MS) AND TIME-RESOLVED LASER-INDUCED FLUORESCENCE (TRLIF) **A3-3**  
*V. Lourenço, E. Ansoborlo, G. Cote, C. Moulin (France)*
- 15:35 STRUCTURES, EQUILIBRIA AND LIGAND EXCHANGE DYNAMICS IN THE BINARY AND TERNARY DIOXOURANIUM(VI)-ETHYLENEDIAMINE-N-N'-DIACETIC ACID - FLUORIDE SYSTEM; A POTENTIOMETRIC, NMR AND X-RAY STUDY. **A3-4**  
*G. Palladino, Z. Szabó, A. Fischer, I. Grenthe (Sweden)*
- 16:00 BREAK

## SESSION 16

## B6-NATURAL ANALOGUES

Chair: *B. D. Honeyman (USA) and R. Guillaumont (France)*

- 16:20 URANIUM ADSORPTION AND FIXATION PROCESSES AT THE KOONGARRA ANALOGUE SITE, NORTHERN AUSTRALIA **B6-1**  
*T.E. Payne, P.L. Airey (Australia)*
- 16:45 URANIUM SPECIATION IN 30-YEAR OLD FREITAL MINE TAILINGS: AN EXAFS,  $\mu$ -XRD, AND  $\mu$ -XRF STUDY **B6-2**  
*A. C. Scheinost, C. Hennig, A. Somogyi, G. Martinez-Criado, R. Knappik (Germany)*
- 17:10 ZIRCONOLITE STABILITY UNDER ALPHA SELF-IRRADIATION: INVESTIGATION OF NATURAL ANALOGS RICH IN THORIUM AND URANIUM **B6-3**  
*T. Advocat, J.L. Crovisier, G. Lumpkin, P. McGlenn, K. Smith (France, Australia)*
- 17:35 END
- 19:00 CONFERENCE BANQUET

## FRIDAY (23. September)

## SESSION 17

## C-MODELLING AND MODEL DEVELOPMENT

Chair: *J. Hadermann (Switzerland) and P. de Cannière (Belgium)*

- 8:30 INCORPORATING CLASSIC ADSORPTION ISOTHERMS INTO MODERN SURFACE COMPLEXATION MODELS: IMPLICATIONS FOR SORPTION OF RADIONUCLIDES **C3-2**  
*D.A.Kulik (Switzerland)*
- 8:55 MONTE CARLO SIMULATION OF RADIONUCLIDES GROUNDWATER TRANSPORT IN PRESENCE OF HETEROGENEITIES AND NONLINEARITIES **C3-3**  
*M. Marseguerra, E. Zio, F. Giacobbo, E. Patelli (Italy)*
- 9:20 MODELLING GLASS ALTERATION IN AN ARGILLACEOUS ENVIRONMENT **C2-2**  
*O. Bildstein, C. Pozo, M. Jullien (France)*
- 9:45 ANALYSIS OF FLUID FLOW AND SOLUTE TRANSPORT THROUGH A SINGLE FRACTURE INTERSECTING A CANISTER: COMPARISON BETWEEN FRACTAL AND GAUSSIAN FRACTURES **C3-4**  
*L. Liu, I. Neretnieks (Sweden)*
- 10:10 ACTINIDE MIGRATION : FROM BASIC STUDIES TO PERFORMANCE ASSESSMENT; HOW TO FIX RESEARCH PRIORITIES **C5-2**  
*P. Toulhoat (France)*
- 10:35 BREAK

10:55 GEOCHEMISTRY OF DEEP GEOLOGICAL REPOSITORIES:  
ITS ROLE IN POST-CLOSURE SAFETY AND EXPECTATIONS ON FUTURE  
RESEARCH  
*P. Zuidema invited (Switzerland)*

C5-3

11:40 CLOSING SESSION

12:10 END