

Migration 2019



Kyoto

September 15 – 20, 2019



Final Programme

Conference Committees

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Contacts

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Migration 2019 is being organised by Kyoto University and KIT



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Background

The MIGRATION conferences provide an international forum for the timely exchange of scientific information on chemical processes controlling the migration behaviour of actinides and fission products in natural aquifer systems. Experimental investigations and predictive modelling of these processes are the main topics of the conferences. The information generated from the MIGRATION conferences is the basis for the mechanistic understanding of the migration behaviour of long-lived radionuclides in the geosphere, which is essential for the long-term performance assessment of nuclear waste disposal.

The first MIGRATION conference was held in 1987 in Munich, Germany. It was followed by MIGRATION '89 in Monterey, California, USA; MIGRATION '91 in Jerez de la Frontera, Spain; MIGRATION '93 in Charleston, South Carolina, USA; MIGRATION '95 in Saint-Malo, France; MIGRATION '97 in Sendai, Japan; MIGRATION '99 in Lake Tahoe, Nevada, USA; MIGRATION '01 in Bregenz, Austria; MIGRATION '03 in Gyeongju, Korea; MIGRATION '05 in Avignon, France; MIGRATION '07 in Munich, Germany; MIGRATION '09 in Kennewick, Washington, USA; MIGRATION '11 in Beijing, China; MIGRATION '13 in Brighton, UK; MIGRATION '15 in Santa Fe, New Mexico, USA and MIGRATION '17 in Barcelona, Spain.

Scope

The MIGRATION conferences focus on recent developments in the fundamental chemistry of actinides, fission and activation products in natural aquifer systems, their interactions and migration in the geosphere, and the processes involved in modelling their geochemical behaviour.

The sessions in MIGRATION'19 cover the following areas:

A Aquatic chemistry of actinides and fission products

- 1) Solubility and dissolution
- 2) Solid solution and secondary phase formation
- 3) Complexation with inorganic and organic ligands
- 4) Redox reactions and radiolysis effects
- 5) Solid-water interface reactions
- 6) Colloid formation
- 7) Experimental methods
- 8) Computational chemistry

B Migration behaviour of radionuclides

- 1) Sorption/desorption phenomena in dynamic systems
- 2) Diffusion and other migration processes
- 3) Colloid migration
- 4) Effects of biological and organic materials
- 5) Field and large scale experiments
- 6) Natural analogues

C Geochemical and transport modelling

- 1) Data selection and evaluation
- 2) Coupling chemistry and transport
- 3) Development and application of models
- 4) Model validation
- 5) Safety assessment and repository concepts

D Application to Case Studies

E Special session:

Research activities towards HLW disposal in Japan and remediation of the Fukushima Daiichi NPS site

Programme

SUNDAY (15. SEPTEMBER)

15:00 **REGISTRATION**

17:00 **WELCOME**

T. Sasaki, T. Ohnuki (Japan)

H. Geckeis (Germany)

OPENING SESSION

E: GEOLOGICAL DISPOSAL IN JAPAN AND REMEDIATION OF THE FUKUSHIMA DAIICHI NPS SITE

Chair: T. Sasaki and T. Ohnuki (Japan)

17:10 ISSUES JAPAN FACES WITHIN THE PROMOTION OF **E-1**
DEEP GEOLOGICAL DISPOSAL OF RADIOACTIVE
WASTE

S. Kondo (INVITED) (NUMO, Japan)

18:10 DECOMMISSIONING OF THE FUKUSHIMA-DAIICHI **E-2**
NPP AND ITS IMPLICATIONS FOR THE WASTE
MANAGEMENT OF NUCLEAR LEGACY SITE

*H. Yamana (INVITED) (Nuclear Damage Compensation and
Decommissioning Facilitation Corporation, Japan)*

19:10 **RECEPTION**

MONDAY (16. SEPTEMBER)

9:05 CONFERENCE ANNOUNCEMENTS

SESSION 1 A5: SOLID-LIQUID INTERFACE REACTIONS*Chair: M. Marques Fernandes (Switzerland) and B. Powell (USA)*

- 9:15 METAL ION SORPTION ON ALUMINUM OXYHYDROXIDES UNDER CONDITIONS OF HIGH LEVEL WASTE TANKS – A SUM FREQUENCY GENERATION – VIBRATIONAL SPECTROSCOPY STUDY **A5-1**
Z. Wang, X. Zhang, W. Cui, H. Zhang, Y. Chen, E. Walter, A. Tuladhar, M. Sassi, C. Pearce, H. Wang, S. Clark, K. Rosso (USA, China)
- 9:40 CARBONATE MEDIATED SORPTION OF Eu(III) / Cm(III) ONTO CLAY MINERALS: BATCH SORPTION, LASER SPECTROSCOPY AND MODELLING **A5-2**
F. Rieder, M. Trumm, A. Skerencak-Frech, T. Rabung, H. Geckeis (Germany)
- 10:05 EFFECT OF REDOX TRANSFORMATIONS AND AQUEOUS COMPLEXATION IN THE TERNARY Pu(III)-EDTA-Fe MINERAL SYSTEM **A5-3**
N. Moore, E. Yalcintas, D.T. Reed, A.E. Hixon (USA)
- 10:30 SORPTION OF TRIVALENT F-ELEMENTS BY MATERIALS OF BIOLOGICAL ORIGIN: NMR AND LUMINESCENCE SPECTROSCOPIC STUDIES **A5-4**
K. Kammerlander, L. Köhler, N. Huittinen, T. Stumpf, E. Brunner (Germany)
- 10:55 BREAK

SESSION 2 B4: EFFECTS OF BIOLOGICAL AND ORGANIC MATERIALS

Chair: K. Morris (UK) and T. Stumpf (Germany)

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| 11:15 | ROLE OF MICROBIAL PROCESSES IN THE ENVIRONMENTAL FATE OF URANIUM
<u>R. Bernier-Latmani</u> , L. Loreggian, M. Molinas, A. Brown, Z. Pan (INVITED) (Switzerland) | B4-1 |
| 12:00 | IN VIVO SPECIATION AND ACCUMULATION MECHANISMS OF URANIUM IN <i>PARACENTROTUS LIVIDUS</i> SEA URCHIN AND <i>LAMINARIA DIGITATA</i> SEAWEED
<u>M. R. Beccia</u> , B. Reeves, R. Bianco, P. L. Solari, L. Mangialajo, C. Leblanc, D. K. Shuh, M. Monfort, C. Moulin, C. Den Auwer (France, Italy, USA) | B4-2 |
| 12:25 | PLUTONIUM-MICROBIAL INTERACTIONS IN THE ENVIRONMENT
<u>D. T. Reed</u> , R. Kimber, J. S. Swanson, J. Lloyd (USA, UK) | B4-3 |
| 12:50 | MICROSCOPIC AND SPECTROSCOPIC INVESTIGATIONS OF THE INTERACTIONS OF A HALOBACTERIUM-ISOLATE WITH URANIUM
<u>S. Hilpmann</u> , M. Bader, M. Bachran, R. Steudtner, M. Schmidt, T. Stumpf, A. Cherkouk (Germany) | B4-4 |
| 13:15 | BREAK | |

SESSION 3 C1: DATA SELECTION AND EVALUATION

Chair: S. Brassinnes (Belgium) and L. Duro (Spain)

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|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 14:30 | VALIDATION OF EXPERIMENTAL RADIONUCLIDE ADSORPTION DATA ON ARGILLACEOUS ROCKS BY MECHANISTIC MODELS
<u>B. Baeyens</u> , M. Marques Fernandes (Switzerland) | C1-1 |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|

- 14:55 NEA-TDB UPDATE BOOK ON U, Np, Pu, Am AND Tc: OVERVIEW, SYSTEMATIC TRENDS AND DATAGAPS OF RELEVANCE TO NUCLEAR WASTE DISPOSAL **C1-2**
X. Gaona, I. Grenthe, A. Plyasunov, L. Rao, W. Runde, B. Grambow, R. Konings, A. L. Smith, E. Moore, K. Spahiu, J. Martinez, M.-E. Ragoussi (Germany, Sweden, Russia, USA, France, Netherlands)
- 15:20 GEOCHEMICAL MODELLING OF RETENTION OF RADIONUCLIDES IN C-S-H **C1-3**
D. A. Kulik, G.-D. Miron, J. Tits, B. Lothenbach (Switzerland)
- 15:45 BREAK

SESSION 4 A2: SOLID SOLUTION AND SECONDARY PHASE FORMATION

Chair: D. Bosbach (Germany) and D. Kulik (Switzerland)

- 16:05 EVOLUTION OF URANIUM SPECIATION DURING SULFIDATION OF IRON (OXYHYDR)OXIDES **A2-1**
L. T. Townsend, S. Shaw, N. E. R. Ofili, N. Kaltsoyannis, A. S. Walton, J. F. W. Mosselmans, T. Neill, R. Hibberd, K. Morris (UK)
- 16:30 MOLYBDENUM SORPTION IN CEMENTITIOUS ENVIRONMENTS. THE ROLE OF AFm ON MIXED AFt/AFm PHASES **A2-2**
M. López-García, J. Olmeda, M. Grivé, L. Duro, P. Henoqc (Spain, France)
- 16:55 TRIVALENT LANTHANIDE AND ACTINIDE INCORPORATION INTO ZIRCONIUM(IV) OXIDE – SPECTROSCOPIC INVESTIGATIONS OF DEFECT FLUORITE STRUCTURES **A2-3**
M. Eibl, S. Shaw, C. Hennig, K. Morris, T. Stumpf, N. Huittinen (Germany, UK)
- 17:20 END OF ORAL SESSIONS OF MONDAY

SESSION 5 POSTER SESSION I (17:20 – 20:20)**PA1 SOLUBILITY AND DISSOLUTION**

- PA1-1** FUEL CORROSION INSIDE A FAILED NUCLEAR WASTE CONTAINER UNDER REPOSITORY CONDITIONS
T. T. Yang, D. W. Shoesmith, J. J. Noël (Canada)
- PA1-2** THE EFFECT OF CARBONATE ION ON THE DISSOLUTION RATE OF UO₂ PELLET
Y. Moroi, A. Kirishima, D. Akiyama, N. Sato, A. Kitamura, S. Kimuro (Japan)
- PA1-3** EFFECT OF ARGILLITE ON THE OXIDATIVE DISSOLUTION OF UO₂ DOPED WITH A RADIOACTIVE ALPHA EMITTER IN SYNTHETIC CLAYEY GROUNDWATER
V. Kerleguer, C. Jégou, L. De Windt, V. Broudic, C. Marques, C. Martin, F. Tocino (France)
- PA1-4** SOLUTION CHEMISTRY AND THERMODYNAMICS OF U(IV) AND U(VI): SOLUBILITY, HYDROLYSIS AND THE TERNARY Ca–U(VI)–CARBONATE SYSTEM
N. Cevirim-Papaioannou, J.-Y. Lee, X. Gaona, E. Yalcintas, V. Montoya, D. Fellhauer, K. Dardenne, M. Altmaier, H. Geckeis (Germany, Korea, USA)

PA2 SOLID SOLUTION AND SECONDARY PHASE FORMATION

- PA2-1** INVESTIGATION ON SECONDARY URANIUM SILICATE MINERALS FORMED IN THE KURT SITE
M. H. Baik, H. -R. Cho (Korea)
- PA2-2** RETENTION OF IODINE BY THE Fe SECONDARY PHASES GREEN RUST AND MAGNETITE
T. Platte, R. Polly, N. Finck, S. Mangold, H. Geckeis (Germany)
- PA2-3** COMPARISON OF THE STABILITY OF U(VI) AND Cm(III) DOPED CALCIUM (ALUMINUM) SILICATE HYDRATE (C-(A)-S-H) PHASES AT SALINE CONDITIONS
J.-M. Wolter, K. Schmeide, N. Huittinen, F. Bok, S. Weiss, V. Brendler, T. Stumpf (Germany)

- PA2-4** ELECTROKINETIC CONTROL OF THE GROWTH OF SECONDARY MINERALS IN COMPACTED MONTMORILLONITE
S. Tanaka (Japan)
- PA3** **COMPLEXATION WITH INORGANIC AND ORGANIC LIGANDS**
- PA3-1** RELATIVE STABILITY OF ACTINIDE(IV) BISALEN COMPLEXES: EXPERIMENT AND THEORY
T. Radoske, S. Schöne, R. Kloditz, J. März, T. Stumpf, A. Ikeda-Ohno (Germany)
- PA3-2** SPECTROSCOPIC AND COMPUTATIONAL STUDIES OF AMERICIUM-DICARBOXYLATE LIGAND COMPLEXES USING COMBINATION OF UV-VIS-LWCC, TRIFS AND DFT CALCULATION
H.-K. Kim, K. Jeong, H.-R. Cho, E.C. Jung, K. Kwak, W. Cha (Korea)
- PA3-3** THERMODYNAMIC STUDIES OF THE COMPLEXATION OF LANTHANIDE/ACTINIDE WITH CEMENT SUPERPLASTICIZER BY ISOTHERMAL TITRATION CALORIMETRY
M. Acker, F. Taube, D.R. Fröhlich, P.J. Panak, S. Taut, T. Stumpf (Germany)
- PA3-4** IMPACT OF TEMPERATURE ON THE COMPLEXATION OF Eu(III) AND Cm(III) WITH AQUEOUS PHOSPHATES
N. Jordan, N. Huittinen, I. Jessat, F. Réal, V. Vallet, S. Starke, M. Demnitz, H. Lösch, V. Brendler (Germany, France)
- PA3-5** INVESTIGATION OF URANYL ION SPECIATION AND SELF-ASSEMBLY IN THE PRESENCE OF 2-SALICYLIDENE GLUCOSAMINE
G. Schaper, M. Wenzel, L. Goetzke, F. Hennersdorf, J. J. Weigand (Germany)
- PA3-6** THERMODYNAMIC STUDY ON THE COMPLEXATION OF DEEP GROUNDWATER HUMIC ACID BY CALORIMETRY
S. Kimuro, M. Terashima, Y. Tachi, Y. Kitatsuji, K. Miyakawa, D. Akiyama, N. Sato, A. Kirishima (Japan)

- PA3-7** LANTHANIDE COMPLEXES OF HYBRID SCHIFF-BASE/CALIX[4]ARENE LIGANDS: SYNTHESIS, STRUCTURES, PROPERTIES AND MAGNETIC BEHAVIOUR
P. Hahn, S. Ullmann, B. Kersting (Germany)
- PA3-8** STUDY OF Th(IV) COMPLEXATION WITH HYDROXAMIC ACID LIGANDS
V. Sladkov, J. Roques, F. Mangin, O. Fonquernie, S. Brandès, M. Meyer, J.-C. Chambron (France)
- PA3-9** FORMATION OF Mg/Ca-UO₂-CO₃ COMPLEXES AT VARIABLE TEMPERATURES (10 – 70 °C)
Y. Jo, A. Kirishima, H.-K. Kim J.-I. Yun (Korea)
- PA3-10** TEMPERATURE EFFECT ON PROTON AND Eu(III) BINDING TO HUMIC SUBSTANCES
Q. Jin, Z.Y. Chen, Z.J. Guo, W.S. Wu (China)
- PA3-11** MULTI-TECHNIQUE STUDY OF THE INTERACTION OF Th(IV) WITH DEFEROXAMINE
M. He, M. Maloubier, J. Roques, C. Le Naour (France)
- PA3-12** PHOTOLUMINESCENT HETERODINUCLEAR CALIX[4]ARENE-COMPLEX
A. Mehnert, B. Kersting (Germany)
- PA4** **REDOX REACTIONS AND RADIOLYSIS EFFECTS**
- PA4-1** REDUCTIVE IMMOBILIZATION OF ⁹⁹Tc(VII) BY DIFFERENT CRYSTALLINE PHASES OF IRON SULFIDE (FeS₂)
D. M. Rodríguez, N. Mayordomo, V. Brendler, K. Müller, D. Schild, T. Stumpf (Germany)
- PA4-2** SPECTROELECTROCHEMICAL STUDIES OF THE Tc(VII) REDUCTION IN AQUEOUS ELECTROLYTE MEDIA
D. M. Rodríguez, N. Mayordomo, V. Brendler, K. Müller, T. Stumpf (Germany)
- PA4-3** PERTECNETATE SORPTION ON SULPHIDE MINERALS
A. Makarov, A. Safonov, Y. Karaseva, Y. Konevnik, I. Proshin, K. German, K. A. Boldyrev, E. Zakharova (Russia)

- PA4-4** EFFECT OF SEVERAL INORGANIC ANIONS ON THE ELECTROCHEMICAL BEHAVIOR OF Ce(III/IV) IN NITRIC ACID MEDIA
Y. Liu, F. Wu, N. Wang, S. Hu (China)

PA5 SOLID-WATER INTERFACE REACTIONS

- PA5-1** EFFICIENT CAPTURE OF ACTINIDES FROM STRONG ACIDIC SOLUTION BY HAFNIUM PHOSPHONATE FRAMEWORKS AND CERAMIC DISPOSAL OF THE ACTINIDES-LOADED PRODUCTS
L. P. Xiong, K. Lv, M. Gu, C. T. Yang, F. C. Wu, S. Hu (China)
- PA5-2** ADSORPTION OF U^{VI} AND Eu^{III} ON ILLITE: THE IMPORTANT ROLE OF ACCESSORY MINERALS
M. Marques Fernandes, A. C. Scheinost, N. Huittinen, B. Baeyens (Switzerland, Germany, France)
- PA5-3** EFFICIENT AND SELECTIVE ADSORPTION OF ⁹⁹TcO₄⁻ USING HEXADECYLPYRIDINIUM (HDPY) MODIFIED BENTONITE
K. L. Shi, J. Q. Yang, Y. Su, W. S. Wu (China)
- PA5-4** SORPTION OF Tc(IV) ON ILLITE AND MX-80 BENTONITE UNDER HIGH IONIC STRENGTH CONDITIONS
J. Racette, A. Walker, T. Yang, S. Nagasaki (Canada)
- PA5-5** SYNTHESIS OF ZEOLITE NaP FROM NATURAL ZEOLITE AND APPLICATION FOR RADIONUCLIDE REMOVAL
S. J. Hong, W. Um (Korea)
- PA5-6** SORPTION OF Se(-II) ONTO ILLITE, BENTONITE, AND SHALE UNDER HIGH IONIC STRENGTH CONDITIONS
A. Walker, J. Racette, T. Yang, S. Nagasaki (Canada)
- PA5-7** EFFECT OF SOLUTION CHEMISTRY ON THE SORPTION OF SELENITE IN GAOMIAOZI BENTONITE
Y. Li, J. G. He, Z. M. Lin, X. Y. Yang, M. K. Chang, C. L. Liu (China)
- PA5-8** SORPTION BEHAVIOUR OF LEAD ONTO MONTMORILLONITE IN THE PRESENCE OF CARBONATE
Y. Sugiura, T. Ishidera, T. Suyama, M. Okazaki, T. Hamamoto, K. Ishida, Y. Tachi (Japan)

- PA5-9** THE BEHAVIOR OF URANYL PEROXIDE NANOCLUSTERS AT THE MINERAL-WATER INTERFACE
A. E. Hixon, L. R. Sadergaski (USA)
- PA5-10** REMOVAL OF RADIONUCLIDES IN WASTE SOLUTION USING CANCRINITE SORBENT
J. Kang, S. Park, W. Um (Korea)
- PA5-11** SORPTION OF U(VI) ONTO NATURAL SOILS AND DIFFERENT MINERAL COMPOSITIONS: THE BATCH METHOD AND SPECTROSCOPY ANALYSIS
Y. Shi, J. He, X. Yang, W. Zhou, J. Wang, X. Li, C. L. Liu (China)
- PA5-12** SORPTION OF Cs(I), Eu(III) AND Np(V) ON ENGINEERING CLAY BARRIERS
A. Semenkova, P. Verma, V. Krupskaya, A. Romanchuk, S. Kalmykov (Russia, India)
- PA5-13** CESIUM INTERACTION WITH MX-80 BENTONITE AND NANOCORE PGN MONTMORILLONITE
N. Pakkanen, E. Puhakka, P. Hölttä (Finland)
- PA5-14** RADIOCAESIUM SORPTION IN GLAUCONITE SANDS OF THE NEOGENE REVEALING SURPRISINGLY STRONG SORPTION POTENTIALS
Y. Bruneel, E. Smolders, L. Van Laer, S. Brassinnes (Belgium)
- PA5-15** ADSORPTION OF Eu(III) ONTO MONTMORILLONITE BY BATCH TECHNIQUE
M. K. Chang, Y. Li, W. Q. Zhou, C. L. Liu (China)
- PA5-16** SORPTION OF U(VI) ON MONTMORILLONITE IN THE PRESENCE OF EDTA: A COMBINED BATCH, XPS AND ATR-FTIR STUDY
W. Q. Zhou, J. G. He, X. Y. Yang, J. Y. Wang, C. L. Liu (China)
- PA5-17** NOVEL POLYAZAMACROCYCLIC RECEPTOR IMPREGNATED MACROPOROUS POLYMERIC RESINS FOR HIGHLY EFFICIENT CAPTURE OF FISSION PALLADIUM FROM NITRIC ACID MEDIA: ADSORPTION BEHAVIOR AND COORDINATION MECHANISM STUDY
F. C. Wu, S. Hu, J. Chen (China)

- PA5-18** THE SYNERGISTIC ELIMINATION OF URANIUM (VI) SPECIES FROM AQUEOUS SOLUTION USING BI-FUNCTIONAL NANOCOMPOSITE OF CARBON SPHERE AND LAYERED DOUBLE HYDROXIDE
X. Wang (China)
- PA5-19** ENHANCED URANIUM(VI) ADSORPTION ON MANGANESE-SUBSTITUTED GOETHITE
J. Y. Wang, W. Q. Zhou, Y. L. Shi, C. L. Liu (China)
- PA5-20** INFLUENCE OF MALONIC ACID ON Eu(III) SORPTION BY γ -ALUMINA
M. A. Patel, A. Soumitra Kar, V. V. Raut, B. S. Tomar (India)

PA6 COLLOID FORMATION

- PA6-1** U(IV)-SILICATE COLLOIDS AND THE INTERACTION OF CORRODED URANIUM METAL WITH SILICATE
T. S. Neill, K. Morris, S. Shaw (UK)
- PA6-2** GENERATION AND STABILITY OF BENTONITE COLLOIDS
P. Hölttä, N. Pakkanen, V. Suorsa (Finland)
- PA6-3** EXAMINATION OF PLUTONIUM NANOPARTICLES WITH MANIFOLD SYNCHROTRON METHODS
E. Gerber, A. Romanchuk, C. Hennig, A. Trigub, A. Scheinost, A. Rossberg, G. Vaughan, L. Amidani, I. Pidchenko, S. Weiss, S. Kalmykov, K. Kvashnina (France, Germany, Russia)

PA7 EXPERIMENTAL METHODS

- PA7-1** APPLICATION OF THE TIME RESOLVED LASER SPECTROSCOPY (TRLIF AND TRLIC) FOR DETECTION OF ACTINIDES/LANTHANIDES IN SOLUTIONS
I. N. Izosimov (Russia)
- PA7-2** ULTRA-SENSITIVE, SPECIFIC, RECYCLABLE DETECTION OF UO_2^{2+} IN REAL SYSTEMS THROUGH A DNAAzyme BASED ZnO-Ag HYBRIDS SERS BIOSENSOR
X. He, Y. Liu, X. Wang (China)

- PA7-3** **AUTORADIOGRAPHY TECHNIQUE TO LOCATE
RADIONUCLIDES ON SOLID SURFACES OF MINERALS**
S. Leblond, P. Fichet, P. Sardini, S. Billon (France)
- PA7-4** **NON-DESTRUCTIVE ISOTOPE ANALYSIS OF MICROMETER
SIZED HOT PARTICLES FROM THE CHERNOBYL
ENVIRONMENT BY RL-SNMS**
*M. Raiwa, H. Bosco, M. Weiss, N. Kneip, K. Wendt, C. Walther
(Germany)*
- PA8** **COMPUTATIONAL CHEMISTRY**
- PA8-1** **CONFORMATIONAL ANALYSIS OF LANTHANIDE-BOUND
METHANOL DEHYDROGENASE**
S. Tsushima (Germany)
- PA8-2** **DENSITY FUNCTIONAL THEORY STUDY OF THE
INCORPORATION OF RADIONUCLIDES IN
HYDROXYCARBONATE AND HYDROXYCHLORIDE GREEN
RUST**
*R. Polly, B. Schimmelpfennig, N. Vozarova, T. Platte, F. Heberling,
N. Finck, H. Geckeis (Germany)*
- PA8-3** **DENSITY FUNCTIONAL THEORY INVESTIGATIONS ON THE
FORMATION MECHANISM OF Pa(V) ION IN HYDROUS
SOLUTIONS**
J. Ma, C. Yang, J. Han, J. Yu, S. Hu, H. Yu, X. Long (China)

PB1 SORPTION/DESORPTION PHENOMENA IN DYNAMIC SYSTEMS

PB1-1 FRACTIONATION OF ACTINIDES AND ^{137}Cs IN CONTAMINATED SEDIMENTS AND MODEL SAMPLES USING SEQUENTIAL EXTRACTION
A. Rzhevskaja, A. Romanchuk, A. Semenkova, I. Vlasova, S. Kalmykov (Russia)

PB1-2 ADSORPTION AND TRANSPORT OF U(VI) IN IRON OXIDE-COATED QUARTZ SAND COLUMN: AN EXPERIMENTAL STUDY
Y. F. Sun, Q. Jin, Z. Y. Chen, Z. J. Guo, W. S. Wu (China)

PB1-3 ENHANCED Sr MOBILITY IN GROUNDWATER BY SEAWATER INTRUSION
S. Chang, G. Wang, W. Um (Korea, USA)

PB1-4 REMOVAL OF ALKALINE EARTH METALS DURING THE FORMATION OF BIOMASS-MANGANESE OXIDE TOWARD ELIMINATION OF ^{226}Ra
T. Kato, Q. Yu, T. Ohnuki (Japan, China)

PB2 DIFFUSION AND OTHER MIGRATION PROCESSES

PB2-1 REDUCED DIFFUSION AND ENHANCED RETENTION OF MULTIPLE RADIONUCLIDES FROM PORE STRUCTURE CHARACTERIZATION OF BARRIER MATERIALS
Q. H. Hu (USA)

PB2-2 APPLICATION OF HYDRUS-1D MODEL FOR ESTIMATE DIFFUSION COEFFICIENT OF PERTECHNETATE ($^{99}\text{TcO}_4^-$) AND HTO IN COMPACTED MX-80 BENTONITE
I.- H. Lee, T.- L. Tsai, C.- F. Ni, Y.- H. Shih, L.- C. Chen, C.- P. Lee, S.- C. Tsai, B.- T. Wang (Taiwan)

PB2-3 PORE SPACE PROPERTY OF BOOM CLAY BEFORE AND AFTER ALKALINE PERTURBATION EXAMINED BY FM-AFM AND PSI MEASUREMENTS
H. Satoh, Y. Araki, Y. Akagi, S. Brassinnes (Japan, Belgium)

- PB2-4** IMPACT OF CEMENT LEACHATES ON THE HTO DIFFUSION IN COMPACTED BENTONITE
E. Hofmanová, T. Rosendorf, R. Červinka (Czech Republic)
- PB2-5** ANION DIFFUSION IN BOOM CLAY, BELGIUM: DIFFUSION-AVAILABLE POROSITY AND ANISOTROPY
Y. Akagi, S. Shimoda, S. Ueta, M. Ochs, S. Brassinnes (Japan, Switzerland, Belgium)
- PB2-6** DIFFUSION OF ²²⁶RADIUM THROUGH OPALINUS CLAY: A COMBINED DIFFUSION AND SORPTION STUDY
F. Brandt, L. Van Loon, M. Klinkenberg, J. Poonoosamy, M. Glaus, D. Bosbach (Germany, Switzerland)
- PB2-7** DIFFUSION AND RETENTION OF RADIONUCLIDES IN CORRODED STEEL REINFORCED CONCRETES
J. Sammaljärvi, V. Hezscko, S. Betelu, S. Migita, E. Muuri, M. Siitari-Kauppi, P. Henocq, S. Gaboreau (Finland, France)

PB3 COLLOID MIGRATION

- PB3-1** ENVIRONMENTAL FATE OF BENTONITE COLLOIDS IN AQUIFER MEDIA: STABILITY AND TRANSPORT
D. Pan, W. Wu (China)
- PB3-2** THE COAGULATION AND TRANSPORT BEHAVIOR OF ILLITE COLLOIDS UNDER ENVIRONMENTAL CONDITIONS
X. Y. Wei, D. Q. Pan, Z. Xu, Y. L. Sun, W. S. Wu (China)
- PB3-3** BIOGENIC COLLOID TRANSPORT OF ACTINIDES IN DEEP ENVIRONMENTS
A. Safonov, K. Boldirev, A. Lobanova, R. Aldabaev, N. Popova, Y. Konevnik, A. Novikov, E. Zakharova (Russia)

PB4 EFFECTS OF BIOLOGICAL AND ORGANIC MATERIALS

- PB4-1** SPECIATION AND ANALYSIS OF SOIL TO PLANT TRANSFER OF PLUTONIUM AND AMERICIUM FOR DOSE ESTIMATION IN CROP CULTIVATION
V. Pottgießer, A. Gust, M. Mandel, B. Riebe, C. Walther (Germany)
- PB4-2** THE FATE OF Sr IN CULTURES OF THE CYANOBACTERIUM *PSEUDANABAENA CATENATA*
L. Foster, A. Cleary, H. Bagshaw, D. Sigeo, J. K. Pittman, K. Morris, K. Zhang, K. F. Smith, J. R. Lloyd (UK)
- PB4-3** COORDINATION OF LANTHANIDES AND ACTINIDES BY 4-PHOSPHORYLPYRAZOLONE RECEPTORS
M. Wenzel, K. Schnaars, F. Hennersdorf, J. März, A. Rossberg, M. Acker, T. Stumpf, J. J. Weigand (Germany)
- PB4-4** BIOGEOGENIC SULFIDE ANTIOXIDANT BUFFER IN NITRATE AND URANIUM POLLUTED AQUIFERS NEAR TO SLUDGE DEPOSITORY AFTER IN SITU BIOREMEDIATION
A. Safonov, N. Popova, P. Seledchik, K. A. Boldyrev, O. Gaskova, A. Boguslavskiy (Russia)
- PB4-5** THE IMPACT OF REPEATED REDOX CYCLING EVENTS ON THE BIOGEOCHEMISTRY OF A SIMULATED LEGACY RADIOACTIVE WASTE TRENCH
A. S. Kinsela, M. Bligh, X. Vazquez-Campos, T. D. Waite, T. E. Payne, M. J. Comarmond, B. Rowling (Australia)
- PB4-6** BINDING, UPTAKE AND TRANSPORT OF RADIONUCLIDES AND THEIR ANALOGUES BY THE FUNGUS *SCHIZOPHYLLUM COMMUNE* UNDER NATURAL CONDITIONS
A. Wollenberg, R. Hübner, A. Günther, L. Freitag, J. Raff, T. Stumpf (Germany)
- PB4-7** CLAY MINERAL DISSOLUTION BY ACTIVITIES OF SIDEROPHORE PRODUCING BACTERIA
T. Kimura, F. Guido-Garcia, N. Kozai, S. Zhang, K. Yamaji, Q. Yu, B. Grambow (Japan, China, France)
- PB4-8** ¹³⁷CS UPTAKE BY *LENTINULA EDODES* (SHIITAKE) MUSHROOMS
F. Guido Garcia, F. Sakamoto, N. Kozai, B. Grambow, K. David (Japan, France)

- PB4-9** AN EXPERIMENTAL STUDY OF MICROBIAL EFFECT ON SIMULANT FUEL DEBRIS
J. Liu, Y. Dotsuta, T. Kitagaki, N. Kozai, K. Yamaji, T. Ohnuki (Japan)

PB5 FIELD AND LARGE SCALE EXPERIMENTS

- PB5-1** THE DETERMINATION OF ^{133}Ba DIFFUSION IN GRANODIORITE FROM AN IN-SITU DIFFUSION EXPERIMENT USING GAMMA SPECTROMETRY AND AUTORADIOGRAPHY; COMPARISON WITH LABORATORY DATA
E. Muuri, O. Tikkanen, A. Martin, A. Lindberg, M. Heule, M. Siitari-Kauppi (Finland, Switzerland)

- PB5-2** EVALUATING THE MASS TRANSPORT CHARACTERISTICS FOR FAULT ZONE IN MUDSTONE AT THE HORONOBE UNDERGROUND RESEARCH LABORATORY
M. Takeda, E. Ishii, H. Ohno, Y. Tachi, T. Ito, K. Nemoto (Japan)

- PB5-3** IN SITU DIFFUSION EXPERIMENT IN MUDSTONE AT THE HORONOBE URL: COMPARATIVE STUDY BETWEEN IN SITU AND LABORATORY TESTS
Y. Tachi, M. Takeda, H. Ohno, T. Ito, T. Sato, K. Nemoto (Japan)

- PB5-4** VADOSE-ZONE ALTERATION OF URANIC PARTICLES IN FIELD LYSIMETER EXPERIMENTS
C. M. Fallon, W. R. Bower, K. Peruski, B. Powell, D. I. Kaplan, K. Morris, I. C. Lyon, D. Grolimund, P. Warnicke, J. F. W. Mosselmans, F. Livens, G. T. W. Law (UK, Finland, USA, Switzerland)

PC1 DATA SELECTION AND EVALUATION

- PC1-1** THE NEW ELECTRONIC DATABASE OF THE NUCLEAR ENERGY AGENCY'S THERMOCHEMICAL DATABASE PROJECT
M. E. Ragoussi, J. S. Martinez, D. Costa, M. Bossant, E. F. Santillan (France, USA)

- PC1-2** THERMOCHIMIE – A THERMODYNAMIC DATABASE TO BE USED IN RADIOACTIVE WASTE MANAGEMENT
S. Brassinnes, R. Hibberd, B. Madé (Belgium, UK, France)

PC2 COUPLING CHEMISTRY AND TRANSPORT

- PC2-1** SENSITIVITY ANALYSES OF NATURAL TRACER PROFILES IN SEDIMENTARY ROCKS OF THE HORONOBÉ URL, JAPAN
H. Sasamoto, R. C. Arthur, P. Alt-Epping, Y. Tachi (Japan, USA, Switzerland)
- PC2-2** TEMPERATURE INDUCED BUFFER POROSITY CHANGE FOR NUCLIDE TRANSPORT USING TAIWAN REFERENCE CASE
S.-Y. Liang, W.-S. Lin, T.-P. Lee, T.-L. Lee (Taiwan)
- PC2-3** AN OPERATIONAL APPROACH TO DESCRIBE THE ^{238}U AND ^{226}Ra TRANSPORT THROUGH A WETLAND LOCATED DOWNSTREAM TO A FORMER U MINE USING SORPTION MODEL FOR PEAT
S. Savoye, C. Beaucaire, M. Descostes (France)

PC3 DEVELOPMENT AND APPLICATION OF MODELS

- PC3-1** REPOSITORY CHEMICAL CONDITIONS AND PLUTONIUM OXIDATION STATES IN THE POST-CLOSURE WASTE ISOLATION PILOT PLANT, CARLSBAD, NEW MEXICO, USA
E. F. U. Santillan, J. A. Schramke, R. T. Peake (USA)
- PC3-2** MODELLING ANALYSIS ON IN SITU LONG TERM DIFFUSION (LTD-II) TEST AT THE GRIMSEL TEST SITE
Y. Fukatsu, T. Ito, Y. Tachi, K. Ishida, A. Martin (Japan, Switzerland)
- PC3-3** MODEL CALCULATIONS FOR RADIONUCLIDE AND COLLOID TRANSPORT IN A GRANITIC SHEAR ZONE AT THE GRIMSEL TEST SITE (CFM PROJECT)
U. Noseck, Th. Schäfer, T. Reiche, I. Blechschmidt (Germany, Switzerland)
- PC3-4** WITHDRAWN

- PC3-5** OPTIMISING NUCLEAR WASTE GLASS DISSOLUTION MODEL KINETIC PARAMETERS
J. Lillington, T. Gout, I. Farnan (UK)
- PC3-6** MODELLING APPROACH TO SIMULATE MIGRATION BEHAVIOR IN SHALLOW UNDERGROUND
Y. Tanaka, T. Hijikata, S. Yokoyama, T. Koyama, S. Okamoto (Japan)
- PC3-7** MODELLING GROUNDWATER TRANSPORT OF HELIUM IN FRACTURED CRYSTALLINE ROCKS
P. Trincherò, M. Sidborn, I. Puigdomènech, A. Iraola, G. Deissmann, D. Bosbach (Spain, Sweden, Germany)
- PC5** **SAFETY ASSESSMENT AND REPOSITORY CONCEPTS**
- PC5-1** EFFECT OF FUEL CYCLE SELECTION ON THE DISPOSABILITY OF WASTES
K. Dungan, R. W. H. Gregg, K. Morris, F. Z. Taylor, G. Butler (UK)
- PC5-2** ESTIMATION OF SORPTION REDUCTION BY ORGANIC LIGANDS IN ACTINIDE-CEMENT SYSTEMS
M. Ochs, F. Dolder, Y. Tachi (Switzerland, Japan)
- PC5-3** SAFETY ASSESSMENT OF COLLOID FACILITATED TRANSPORT CASE ON THE SPENT NUCLEAR FUEL DISPOSAL IN TAIWAN
C. C. Chang, Y. H. Huang, J. Wu, S. J. Chang (Taiwan)
- PC5-4** EVALUATION OF THE TECHNICAL OPTIONS ON WASTE MANAGEMENT AND DISPOSAL: FUTURE INVESTIGATION ON ENVIRONMENTAL IMPACT ANALYSIS WHERE THE MA SEPARATION AND NUCLIDE MIGRATION IS CORRELATED
E. Minari, T. Okamura, M. Nakase, H. Asano, K. Takeshita (Japan)

PD APPLICATION TO CASE STUDIES

- PD-1** MOCK-UP TUNNEL CLOSURE TEST AND HYDRO-CHEMICAL COUPLING SIMULATION OF ENVIRONMENTAL CONDITION AS A BASIS OF SOLUTE-TRANSPORT ANALYSIS
Y. Ozaki, T. Iwatsuki, H. Onoe (Japan)
- PD-2** POLLUTION SURVEY OF ARTIFICIAL RADIOISOTOPES IN AUSTRIA
C. Landstetter, K. M. Bartholomew, A. Achatz, W. Ringer (Austria)
- PD-3** RADIOCESIUM IN SEWAGE SLUDGE ASH
N. Kozai, S. Suzuki, F. Sakamoto, T. Ohnuki (Japan)
- PD-4** REGIONAL-SCALE TEMPORAL EVOLUTION OF AIR DOSE RATES AFTER THE FUKUSHIMA DAIICHI NUCLEAR POWER PLANT ACCIDENT AND LONG-TERM MONITORING OPTIMIZATION
H. M. Wainwright, D. Sun, C. Oroza, A. Seki, S. Mikami, H. Takemiya, K. Saito (USA, Japan)
- PD-5** BIOGEOCHEMICAL MODELING OF ACTINIDE AND TECHNETIUM MIGRATION IN SUBSURFACE WATER WITH HIGH NITRATE CONCENTRATION DURING BIOREMEDIATION
A. Safonov, R. Aldabaev, Y. Konevnik, N. Popova, A. Lobanova, K. A. Boldyrev, T. Babich, E. Zakharova (Russia)
- PD-6** INTEGRATION OF LABORATORY AND FIELD EXPERIMENTS TO INTERPRET ACTINIDE DISTRIBUTIONS AT A LEGACY TRENCH DISPOSAL SITE
T. E. Payne, A. S. Kinsela, J. J. Harrison, M. P. Johansen, D. Anderson, M. Bligh, M. J. Comarmond, S. Hankin, B. Rowling, A. Silitonga, S. Thiruvoth, C. Vardanega, X. Vazquez-Campos, T. D. Waite, K. Wilsher, H. K. Wong (Australia)
- PD-7** TRITIUM SPECIATION IN ENVIRONMENTAL MATRICES BY ISOTOPIC EXCHANGE
A. Nivesse, N. Baglan, G. Montavon, O. Péron (France)
- PD-8** ABOVE- AND BELOWGROUND DISTRIBUTIONS OF RADIOCESIUM RELEASED FROM TEPCO'S FDNPP ACCIDENT IN THE MOUNTAINOUS FOREST OF FUKUSHIMA
T. Niizato, Y. Sasaki, S. Ito, K. Mitachi, T. Watanabe (Japan)

- PD-9** DISTRIBUTION OF PLUTONIUM ISOTOPES AND AMERICIUM-241 IN UPLAND AGRICULTURAL SOILS THROUGHOUT JAPAN BEFORE THE FUKUSHIMA NUCLEAR ACCIDENT
J. Zheng, Z. T. Wang, Y. Y. Ni, K. Tagami, S. Uchida (Japan, China)
- PD-10** IMPACT OF VITRIFICATION TREATMENT ON LEACHING BEHAVIOUR OF FISSION PRODUCTS FROM MCCI DEBRIS
Y. Kodama, S. Sakamoto, D. Akiyama, A. Kirishima, T. Kobayashi, N. Sato, T. Sasaki (Japan)
- PD-11** IMPORTANCE OF HALOGEN FOR SOIL DECONTAMINATION USING CESIUM-FREE MINERALIZATION: A ROLE OF CHLORINE ON PHASE TRANSFORMATION OF WEATHERED BIOTITE
I. Shimoyama, Y. Baba (Japan)
- PD-12** STUDY ON WATER-REPELLENT TREATMENT METHOD FOR SUPPRESSING ELUTION OF RADIOACTIVE CESIUM FROM MUNICIPAL SOLID WASTE INCINERATION FLY ASH
T. Amano, D. Fukuda, Y. Koike, N. Ogawa (Japan)
- PD-13** TRANSPORT AND TRANSFER BEHAVIOUR OF LONG-LIVED RADIONUCLIDES ALONG THE CAUSAL GROUNDWATER-SOIL-SURFACE-PLANT CHAIN TAKING INTO ACCOUNT LONG-TERM CLIMATIC CHANGES: THE TRANS-LARA PROJECT
A. Gust, M. Mandel, S. Pottgießer, B. Riebe, C. Walther (Germany)
- PD-14** THE JOINT PROJECT TRANSENS: TRANSDISCIPLINARY RESEARCH ON THE DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTE IN GERMANY
C. Walther, K.- J. Röhlig (Germany)
- PD-15** MEET-CINCH: A MODULAR EUROPEAN EDUCATION AND TRAINING CONCEPT IN NUCLEAR AND RADIOCHEMISTRY
V. Pottgießer, C. Walther, J. John (Germany, Czech Republic)
- PD-16** WIPP TRU REPOSITORY: UPDATE OF THE SAFETY CASE
D. T. Reed, F. E. Stanley, J. S. Swanson, E. Yalcintas, C. Hazelton (USA)
- PD-17** FINAL RESULT FROM THE EC HORIZON2020 CEBAMA PROJECT
M. Altmaier, V. Montoya, L. Duro, A. Valls, E. Holt, F. Claret, U. Müder, B. Grambow, A. Idiart (Germany, Spain, Finland, France, Switzerland)

TUESDAY (17. SEPTEMBER)

9:05 CONFERENCE ANNOUNCEMENTS

**SESSION 6 E: RESEARCH ACTIVITIES TOWARDS
GEOLOGICAL DISPOSAL IN JAPAN AND
REMEDICATION OF THE FUKUSHIMA DAIICHI
NPS SITE***Chair: T. Ohnuki and T. Kobayashi (Japan)*

- 9:15 ESTIMATION OF FUEL DEBRIS PROPERTIES BY EXPERIMENTAL APPROACH FOR FUKUSHIMA DAIICHI NPS **E-3**
T. Washiya, M. Takano, H. Hirano, K. Yano, T. Mitsugi (INVITED) (Japan)
- 10:00 MIGRATION OF RADIOCESIUM AND RADIOIODINE IN THE ENVIRONMENT EMITTED DURING FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT **E-4**
Y. Takahashi, (INVITED) (Japan)
- 10:25 DEVELOPMENT OF THE SDM-BASED PRE-SITING SAFETY CASE IN JAPAN **E-5**
T. Fujiyama, K. Fujisaki, H. Umeki (INVITED) (Japan)
- 10:50 TOWARDS GEOLOGICAL DISPOSAL IN JAPAN AND REMEDIATION OF THE FUKUSHIMA DAIICHI NPS SITE: RESEARCH STRATEGY IN THE GLOBAL CONTEXT **E-6**
B. Grambow, R.C. Ewing, T. Ohnuki (INVITED) (Japan, France, USA)
- 11:15 BREAK

SESSION 7 D: CASE STUDIES

Chair: T. Payne (Australia) and C. Liu (China)

- 11:35 MECHANISMS OF RADIONUCLIDE IMMOBILIZATION: **D-1**
 A HANFORD CASE STUDY
*C. I. Pearce, E. A. Cordova, J. W. Morad, K. J. Cantrell,
 S. A. Saslow, O. Qafoku, T. G. Levitskaia, S. M. Heald,
 J. E. Szecsody, M. J. Rigali, R. C. Moore, V. L. Freedman
 (INVITED) (USA)*
- 12:20 ANALYSIS OF FUTURE BEHAVIOR AND POSSIBLE **D-2**
 COUNTERMEASURES FOR CONTAMINATED
 GROUNDWATER OF FUKUSHIMA-DAIICHI NUCLEAR
 POWER STATION
*T. Koyama, Y. Tanaka, D. Tsumune, T. Hijikata,
 T. Hattori M. Kamoshida, A. Hasunuma, K. Hida,
 M.M. Uematsu, T. Fukuda (INVITED) (Japan)*
- 12:45 U MIGRATION PROCESSES IN U MINES WASTE **D-3**
 ROCKS: IMPACT OF THE WEATHERING CONDITIONS
 ON THE MAIN U-BEARING PHASES
*F. Lahrouch, A. Tayal, A. Kanzari, M. Hunaul,
 P. L. Solari, M. Descostes, M. Gérard (France, Germany)*
- 13:10 BREAK

SESSION 8 A8: COMPUTATIONAL CHEMISTRY

Chair: V. Vallet (France) and K. M. Rosso (USA)

- 14:30 INTERACTIONS BETWEEN F-ELEMENT **A8-1**
 NANOCRYSTALS AND SURFACE LIGANDS
*P. Yang, E. R. Batista, A. Karakoti, G. Wang, W. Wang,
 S. Thevuthasan (USA, India, China)*
- 14:55 ADDRESSING RADIOCESIUM CONTAMINATION IN **A8-2**
 FUKUSHIMA WASTE SOIL THROUGH THE LENS OF
 SYSTEMATIC NUMERICAL SIMULATIONS
*M. Okumura, S. Kerisit, I. C. Bourg, L. N. Lammers,
 T. Ikeda, M. Sassi, K. M. Rosso, M. Machida (Japan, USA)*

- 15:20 QUANTUM CHEMICAL MODELING OF U(VI) SORPTION ON CALCIUM SILICATE HYDRATE **A8-3**
A. Kremleva, S. Krüger, N. Rösch (Germany)
- 15:45 BREAK

SESSION 9 A7: EXPERIMENTAL METHODS

Chair: J.-I. Yun (Korea) and C. Walther (Germany)

- 16:05 EFFECT OF LASER-INDUCED REACTION ON THE SPECIES DISTRIBUTION OF U(VI) ADSORBED ONTO AN AMORPHOUS SILICA SURFACE **A7-1**
E. C. Jung, Y. Jo, T.-H. Kim, H.-K. Kim, H.-R. Cho, W. Cha, M.H. Baik, J.-I. Yun (Korea)
- 16:30 DIGITAL AUTORADIOGRAPHY OF ALPHA AND BETA PARTICLES EMISSIONS IN GEOLOGICAL SAMPLES USING THE BEAQUANT™ : AN OVERVIEW **A7-2**
P. Sardini, S. Billon, A. Angileri, C. Beaucaire, D. Beaufort, J. Donnard, J.C. Parneix, M. Siitari-Kauppi, M. Descostes (France, Finland)
- 16:55 RESEARCH PROGRESS OF TRACE URANYL IONS DETECTION BY SURFACE-ENHANCED RAMAN SCATTERING (SERS) **A7-3**
X. He, S. Wang, X. Wang (China)
- 17:20 END OF ORAL SESSIONS OF TUESDAY

SESSION 10 POSTER SESSION II (17:20 – 20:20)**PA1 SOLUBILITY AND DISSOLUTION**

- PA1-5** RADIONUCLIDE - ORGANIC INTERACTION: IMPACT ON THE SOLUBILITY OF M(III/IV) UNDER REPOSITORY-RELEVANT pH / E_h CONDITIONS
X. Gaona, A. Tasi, N. Adam, S. Duckworth, D. Fellhauer, M. Altmaier, H. Geckeis (Germany)
- PA1-6** CHEMICAL FORM OF STABLE CARBON RELEASED FROM GAS-ATOMIZED 316L STAINLESS-STEEL POWDER
R. Nakabayashi, T. Fujita (Japan)
- PA1-7** $NpO_2(s)$ DISSOLUTION UNDER VADOSE ZONE CONDITIONS
K. Peruski, D. I. Kaplan, B. A. Powell (USA)
- PA1-8** EFFECTS OF THE DOPANTS IN UO_2 MATRIX ON THE DISOLUTION OF THE SPENT FUEL UNDER CEMENTITIOUS STORAGE CONDITIONS
J. Cobos, N. Rodríguez-Villagra, S. Fernández (Spain)
- PA1-9** SOLUBILITY, SPECIATION AND SOLID PHASE FORMATION OF Pu(VI) IN ALKALINE $CaCl_2$ AND $NaCl$ SOLUTIONS
A. Kuzenkova, D. Fellhauer, D. Schild, X. Gaona, A. Romanchuk, J. Rothe, S. Kalmykov, M. Altmaier (Russia, Germany)

PA2 SOLID SOLUTION AND SECONDARY PHASE FORMATION

- PA2-5** CHANGES IN THE CHEMICAL, PHYSICAL AND MIGRATION PROPERTIES OF CEMENTITIOUS MATERIALS FOLLOWING INTERACTION WITH BENTONITE AND TEMPERATURE LOADING
P. Večerník, R. Červinka, T. Rosendorf, R. Vašíček (Czech Republic)
- PA2-6** THE TRANSPORT, CHEMICAL AND PHYSICAL PROPERTIES OF BENTONITE-CEMENT MIXTURES AS A POTENTIAL ALTERNATIVE BUFFER MATERIAL
P. Večerník, V. Kašpar, E. Hofmanová, V. Havlová (Czech Republic)

- PA2-7** TRAVELLING CaCO_3 PRECIPITATION REACTION FRONT IN COMPACTED BENTONITE UNDER ELECTRICAL POTENTIAL GRADIENT
J. Rachmadetin, M. Mizuto, T. Kozaki, N. Watanabe (Japan, Indonesia)
- PA2-8** A NEW TECHNIQUE FOR REMOVING SELENITE AND SELENATE FROM AQUEOUS SOLUTION BY COPRECIPITATION WITH BARITE
K. Tokunaga, Y. Takahashi, N. Kozai (Japan)
- PA3** **COMPLEXATION WITH INORGANIC AND ORGANIC LIGANDS**
- PA3-13** THE COMPLEXATION AND THERMODYNAMICS OF Cm(III) WITH F^- AT $T = 25$ TO 200 °C STUDIED BY TIME RESOLVED LASER FLUORESCENCE SPECTROSCOPY
C. Koke, A. Skerencak-Frech, P. J. Panak (Germany)
- PA3-14** DESIGN OF MOLECULAR STRUCTURES OF URANYL NITRATE COORDINATION POLYMERS BRIDGED BY DOUBLE-HEADED 2-PYRROLIDONE DERIVATIVES
T. Inoue, H. Kazama, S. Tsushima, K. Takao (Japan, Germany)
- PA3-15** CALCIUM SILICA SPECIATION AND CARBONATION IN RELATION TO C-S-H HYDRATES SOLUBILITY
A. Tasi, L. Andre, P. Blanc, S. Grangeon, A. Lach, X. Gaona, M. Altmaier, F. Claret, B. Made (Germany, France)
- PA3-16** COMPLEXATION OF ACTINIDES WITH BORATE AND POLYBORATES
R. Meier, T. Kitagaki, N. Kozai, D. Fellhauer, T. Kobayashi, T. Ohnuki (Japan, Germany)
- PA3-17** STRUCTURES OF ACTINIDES(III) AND (IV) WITH DOTA LIGAND
D. Guillaumont, M. Audras, L. Berthon, T. Dumas, C. Tamain, Ph. Moisy (France)
- PA3-18** INTERACTION OF TECHNETIUM WITH SULFATE AND GLUCONATE UNDER REDUCING CONDITIONS
S. Duckworth, X. Gaona, K. Dardenne, J. Rothe, M. Altmaier, H. Geckeis (Germany)

- PA3-19** TOWARDS UNDERSTANDING OF U(VI) INTERACTION WITH BOOM CLAY DISSOLVED ORGANIC MATTER
Y. Buchatskaya, S. Salah, D. Durce, R. Stedtmer, K. Schmeide, M. Devillers (Belgium, Germany)
- PA3-20** SYNTHETIC APPROACHES TOWARDS THIACALIX[4]ARENE BASED F-ELEMENT RECEPTOR
T. Zielke, B. Kersting (Germany)
- PA3-21** GAMMA-RAY IRRADIATION IMPACT ON APPARENT FORMATION CONSTANT OF DIVALENT METAL IONS WITH HUMIC SUBSTANCES
Q. Zhao, T. Sasaki (Japan)
- PA3-22** STABILITY OF URANYL-CARBONATE COMPLEXES AT ELEVATED TEMPERATURES UP TO 250 °C
A. Kalintsev, A. Migdisov, H. Xu, R. Roback, J. Brugger (USA, Australia)
- PA3-23** STRUCTURE STUDY OF URANYL PHOSPHONATE-BASED LIGANDS AS POTENTIAL URANIUM DECORPORATION AGENTS
G. Ye, E. Simoni, J. Roques, C. Den Auwer, L. J. Charbonnière, P.-L. Solari (France)
- PA3-24** EFFECT OF CALCIUM ON THE PLUTONIUM-EDTA SYSTEM: SOLUBILITY, REDOX BEHAVIOR, AND AQUEOUS SPECIATION
N. A. Moore, A. Tasi, X. Gaona, D. Fellhauer, D. T. Reed, M. Altmaier, A. E. Hixon (USA, Germany)
- PA4** **REDOX REACTIONS AND RADIOLYSIS EFFECTS**
- PA4-5** SPECIATION, SOLUBILITY AND COMPLEXATION OF NEPTUNIUM (V) UNDER ALPHA RADIOLYSIS IN CARBONATE MEDIA
E. Craff, J. Vandenborre, G. Blain, F. Haddad, M. Fattahi (France)
- PA4-6** PHOTOCHEMICAL REDUCTION OF $[\text{UO}_2(\text{CO}_3)_3]^{4-}$ WITH BOROHYDRIDES
K. Takao, S. Tsushima (Japan, Germany)

PA4-7 REDOX CHEMISTRY OF Np(V)/Np(IV)
IN REDUCING AQUEOUS SOLUTION AT T = 23 AND 80 °C
D. Fellhauer, J.- Y. Lee, X. Gaona, D. Schild, M. Altmaier
(Germany, Korea)

PA5 SOLID-WATER INTERFACE REACTIONS

PA5-21 CHARACTERISATION OF CALCIUM-ALUMINIUM-SILICATE
HYDRATE (CASH) PHASES AND THEIR SORPTION
CAPABILITY FOR CESIUM
T. Missana, M. García-Gutiérrez, M. Mingarro, U. Alonso (Spain)

PA5-22 Ba AND Sr ADSORPTION ON MICROBIALLY FORMED Mn
OXIDE: IMPLICATION TO REMOVAL OF Ra FROM U MINING
WASTEWATER
K. Tanaka, N. Kozai, K. Yamaji, H. Masuya, B. Grambow
(Japan, France)

PA5-23 IDENTIFYING THE ROLE OF STRUCTURAL IRON IN THE
IMMOBILIZATION OF URANIUM BY SMECTITE MINERALS
S. T. Yang, H. B. Qin, T. Hamamoto, J. Sun, T. Itai, Y. Takahashi
(Japan, China)

PA5-24 BORON SORPTION ON Na-MONTMORILLONITE
Y. Chen, T. Sawaguchi, Y. Iida (Japan)

PA5-25 SPECTROSCOPIC ANALYSIS ON SORPTION SPECIATION OF
URANIUM ON SOLID-WATER INTERFACE
W. Wu, D. Pan (China)

PA5-26 SORPTION OF IODIDE ION ONTO CORE-SHELL MAGNETIC
NANOPARTICLE@LAYERED DOUBLE HYDROXIDE
COMPOSITES FROM AQUEOUS SOLUTION
I. -K. Jung, Y. Jo, J. -I. Yun (Korea)

PA5-27 APPLICATION OF GRAPHENE HYDROGEL-BASED MATERIALS
FOR RADIOACTIVE WASTEWATER TREATMENT
Y.- R. He, Z.- Y. Tan, D. Zhang (China)

- PA5-28** SORPTION OF ^{137}Cs , ^{226}Ra , ^{243}Am , ^{75}Se , ^{230}Th , ^{237}Np , ^{233}U AND ^{242}Pu ON ROCK SAMPLES FROM THE OVERBURDEN OF THE ASSE II SALT MINE
T. Rabung, B. Kienzler, A. Skerencak-Frech, M. Schlieker, D. Fellhauer, M. Plaschke, F. Geyer, C. Walschburger, T. Kisely, M. Böttle, M. Fuss, M. Altmaier, V. Metz, H. Geckeis (Germany)
- PA5-29** SURFACE STUDIES ON SPENT NUCLEAR FUEL MODELS
A. Seibert, G. El Jamal, R. Eloirdi, F. Huber, T. Gouder (Germany, Sweden)
- PA5-30** COMPONENT ADDITIVITY MODELING OF URANIUM (VI) AND EUROPIUM (III) ADSORPTION ONTO SOIL
B. Liu, Y. Xie, B. A. Powell (China, USA)
- PA5-31** AN APPROACH FOR THE EFFICIENT IMMOBILIZATION OF ^{79}Se USING Fe-OOH MODIFIED GMZ BENTONITE
J. Yang, K. Shi, X. Hou, W. Wu (China)
- PA5-32** SORPTION OF BERYLLIUM IN FRESH ORDINARY PORTLAND CEMENT PASTE
S. Han, N. Cevirim-Papaioannou, X. Gaona, W. Um, M. Altmaier (Korea, Germany)
- PA5-33** THE EFFECT OF CARBOXILIC ACIDS ON U^{VI} , Th^{IV} , Eu^{III} / Am^{III} SORPTION ONTO CLAY-ROCKS
R. V. H. Dagnelie, E. Thory, L. Fralova, J.- C. Robinet, B. Madé (France)
- PA5-34** COMPARISON OF THE RETENTION OF $\text{An}(\text{III})/\text{Ln}(\text{III})$ ON CSH AND CAH PHASES UNDER THE INFLUENCE OF MALATE
F. Taube, T. Zimmermann, M. Acker, H. Foerstendorf, S. Taut, T. Stumpf (Germany)
- PA5-35** PREDICTION OF CESIUM MIGRATION BASED ON HETEROGENEITIC SORPTIVE PROPERTIES OF ILLITE GROUP
J. Hwang, S. Choung, W. Shik Han, W. Shin (Korea)
- PA5-36** PHOSPHONATE DECORATED COVALENT ORGANIC FRAMEWORKS FOR ACTINIDE EXTRACTION: A BREAKTHROUGH UNDER HIGHLY ACIDIC CONDITIONS
L. Yuan, J. Yu, S. Wang, J. Lan, L. Zheng, C. Xu, J. Chen, L. Wang, Z. Huang, W. Tao, Z. Chai, J. K. Gibson, W. Shi (China, USA)

- PA5-37** QUANTITATIVE ANALYSIS OF SURFACE SITES ON CARBON DOTS AND THEIR INTERACTION WITH METAL IONS BY POTENTIOMETRIC TITRATION METHOD
Z. Wang, Y. Xie, Y. Lu, X. Wang, L. Rao, J. Chen (China, USA)
- PA5-38** VIOLOGEN DERIVATIVE BASED URANYL COORDINATION POLYMERS FOR ReO_4^- REMOVAL
L. Zeng, K. Hu, L. Mei, F. Li, Z. Huang, Z. Chai, W. Shi (China)
- PA5-39** THREE-DIMENSIONAL GRAPHENE/TITANIUM DIOXIDE COMPOSITE FOR ENHANCED U(VI) CAPTURE: INSIGHTS FROM BATCH EXPERIMENTS, XPS SPECTROSCOPY AND DFT CALCULATION
S. Yu (China)

PA6 COLLOID FORMATION

- PA6-4** ON FORMING “GIANT CLUSTERS” IN AN ACIDIC SOLUTION OF Ce(IV) NITRATES
N. Aoyagi, R. Motokawa, T. Saito, M. Okumura, A. Ikeda-Ohno (Japan)
- PA6-5** Pu M_5 EDGE HR-XANES INVESTIGATIONS OF AQUEOUS/COLLOIDAL Pu
A. Beck, A. Tasi, J. Galanzew, I. Pidchenko, D. Fellhauer, M. Altmaier, K. Dardenne, J. Rothe, H. Geckeis, T. Vitova (Germany)
- PA6-6** WITHDRAWN

PA7 EXPERIMENTAL METHODS

- PA7-5** ROBL-II: A DEDICATED ACTINIDE BEAMLINE FOR X-RAY SPECTROSCOPY AND SCATTERING TECHNIQUES
A. C. Scheinost, K. Kvashnina, Ch. Hennig, J. Exner, A. Rossberg, M. Schmidt, T. Stumpf (France, Germany)
- PA7-6** EVALUATION OF LABILE ^{137}Cs IN CONTAMINATED ENVIRONMENTS BY DIFFUSIVE GRADIENTS IN THIN FILMS
M. Fukuoka, T. Saito (Japan)

- PA7-7** ULTRA-TRACE ANALYSIS WITH AMS IN NUCLEAR WASTE DISPOSAL RESEARCH: RESULTS FROM THE CFM PROJECT AT THE GRIMSEL TEST SITE
F. Quinto, I. Blechschmidt, T. Faestermann, K. Hain, D. Koll, G. Korschinek, S. Kraft, P. Ludwig, M. Plaschke, F. Rinderknecht, T. Schäfer, P. Steier, H. Geckeis (Germany, Switzerland, Austria)
- PA7-8** DETERMINING CRACK APERTURE DISTRIBUTIONS IN ROCKS USING ^{14}C -PMMA AUTORADIOGRAPHIC METHOD BY COUPLING SIMULATION AND EXPERIMENTAL APPROACHES
M. Bonnet, P. Sardini, M. Siitari-Kauppi, J. Kuva, K.-H. Hellmuth, L. Caner (France, Finland)
- PA7-9** AN APPROACH FOR DEVELOPMENT OF ELECTROCHEMICAL SENSOR FOR AQUEOUS SPECIATION OF ACTINIDES
A. Srivastava, N. Rawat, A. K. Satpati, A. K. Singha Deb, S. Musharaf Ali (India)

PA8 COMPUTATIONAL CHEMISTRY

- PA8-4** THEORY AND SIMULATION ADVANCES ENABLING INSIGHTS INTO RADIOCESIUM INTERACTION WITH CLAY MINERALS
K. M. Rosso, M. Okumura, S. Kerisit, I. C. Bourg, L. N. Lammers, T. Ikeda, M. Sassi, M. Machida (USA, Japan)
- PA8-5** COMPUTATIONAL MOLECULAR STUDY OF PREDOMINANT ORGANIC MOLECULES IN FOREST ECOSYSTEMS CONCERNING CESIUM ACCUMULATION AND TRANSPORT
H. Suno, M. Machida, T. Dohi, Y. Ohmura, Y. Sasaki (Japan)
- PA8-6** QUANTUM CHEMICAL MODELING OF DIMERIC ACTINIDE COMPLEXES
I. Chiorescu, A. Gray, S. Krüger, N. Rösch (Germany)

PB1 SORPTION/DESORPTION PHENOMENA IN DYNAMIC SYSTEMS

- PB1-5** URANIUM SPECIATION: VERIFICATION OF A THERMODYNAMIC DATABASE AND ITS APPLICATION FOR INSITU IMMOBILIZATION OF URANIUM AT LABORATORY SCALE
S. Pottgießer, E. L. Mühr-Ebert, F. Wagner, C. Walther (Germany)
- PB1-6** THE INTERACTION MECHANISM BETWEEN CESIUM AND MICACEOUS MINERALS CONSIDERING THE IMPACT OF CHEMICAL WEATHERING
H. Wu, W. Wang, Q. Fan, M. Kang, W. Wu (China)
- PB1-7** MIGRATION PROCESSES OF ^3H , ^{14}C , ^{36}Cl AND ^{125}I ON CEMENTITIOUS MATERIALS USED IN THE WASTE MANAGEMENT IN THE CZECH REPUBLIC
P. Večerník, L. Brázda, V. Havlová (Czech Republic)

PB2 DIFFUSION AND OTHER MIGRATION PROCESSES

- PB2-8** EFFECT OF SALINE CONDITIONS ON HTO AND ^{125}I BASIC TRANSPORT PROPERTIES IN BOOM CLAY
L. Van Laer, N. Maes, D. Verhaegen, M. Van Gompel, S. Brassinnes (Belgium)
- PB2-9** A NOVEL SETUP OF ELECTROMIGRATION FOR A LARGE PIECE OF ROCK AND A NEWLY DEVELOPED MODEL FOR DATA ANALYSIS
S. Meng, X. Li, L. Liu (Sweden, Finland)
- PB2-10** DIFFUSION OF RADIONUCLIDES IN ARGILLACEOUS CLAYS OF CUDDAPAH REGION
M. A. Patel, A. S. Kar, S. Kumar, R. K. Bajpai, B. S. Tomar (India)
- PB2-11** DIFFUSION OF $^{152+154}\text{Eu}$ IN ALTERED Fe(III)-MONTMORILLONITE CLAY MINERAL
S. Chikkamath, M. A. Patel, A.- S. Kar, S. Kumar, B. S. Tomar, J. Manjanna (India)

- PB2-12** ANALYSIS OF RADIONUCLIDE DIFFUSION ON CONSOLIDATED AND COMPACTED LUTITES AS FUNCTION OF THEIR SATURATION DEGREE
M. García-Gutiérrez, T. Missana, M. Mingarro, J. Morejón (Spain)
- PB2-13** EFFECT OF EXPERIMENTAL SET-UPS ON THE DETERMINATION OF DIFFUSION COEFFICIENTS IN CLAYS
D. Durce, M. Aertsens, N. Maes, S. Brassinnes (Belgium)
- PB2-14** MICRO-SCALE ANALYSIS OF BARIUM AND URANIUM DIFFUSION IN CEMENT
U. Alonso, M. García-Gutierrez, T. Missana, A. Patelli, V. Rigato (Spain, Italy)

PB3 COLLOID MIGRATION

- PB3-4** INFLUENCE OF GIBBSITE COLLOID ON CO-TRANSPORT OF U(VI) AND BENTONITE COLLOID IN SATURATED GRANITE PARTICLE COLUMN
Z. Chen, Z. Zhang, Q. Jin, Z. Guo, W. Wu (China)
- PB3-5** URANIUM (VI) TRANSPORT IN WATER-SATURATED POROUS MEDIA IN THE PRESENCE OF COLLOIDAL FERRIHYDROXIDE AND HUMIC ACID: ROLES OF U(VI) CONCENTRATION AND THE RATIO OF TWO KINDS OF COLLOIDS
Z. Guo, M. Ge, J. Yang, Q. Jin, Z. Chen, W. Wu (China)
- PB3-6** EFFECTS OF GOETHITE AND GIBBSITE COLLOIDS ON TRANSPORT AND RETENTION OF URANIUM (VI) IN WATER-SATURATED GEOLOGIC POROUS MEDIA
M. Ge, J. Yang, Y. Sun, Q. Jin, Z. Chen, W. Wu, Z. Guo (China)

PB4 EFFECTS OF BIOLOGICAL AND ORGANIC MATERIALS

- PB4-10** BIOREMEDIATION USING SOIL INDEGENOUS UREOLYTIC BACTERIA
H. Raveh-Amit, O. Klein-BenDavid, N. Banano, S. Gelfer, A. Nikolski, G. Bar-Nes, M. Tsesarsky (Israel)
- PB4-11** REGULATORY MECHANISMS OF U-P BIOMINERLIZATION BY PHOSPHORUS MOLECULES OF BACTERIA AT DYNAMIC REDOX ZONE OF URANIUM MINE
X. Nie, F. Dong, M. Liu, C. Ding, K. M. Kemner (China, USA)
- PB4-12** THE INFLUENCE OF METAL CATIONS ON URANIUM BIOMINERALIZATION BY BACILLUS
H. Tu, G. Yuan, C. Zhao, J. Liu, F. Li, J. Yang, J. Liao, Y. Yang, N. Liu (China)
- PB4-13** CHARACTERIZATION OF DISSOLVED ORGANIC MATTER (DOM) FROM BOOM CLAY: SIZE DISTRIBUTION, NATURAL TRACE ELEMENT CONTENT, AND COMPLEXATION WITH TRIVALENT METAL IONS
A. Schnurr, M. Bouby, U. Kaplan, T. Rabung, M. Altmaier, S. Brassinnes, H. Geckeis (Germany, Belgium)
- PB4-14** INVESTIGATING THE ROLE OF U(V) DURING MICROBIALY MEDIATED REDUCTION OF URANYL(VI)
G. F. Vettese, K. Morris, L. Natrajan, S. Shaw, T. Vitova, J. Rothe, J. R. Lloyd (UK, Germany)
- PB4-15** MICROBIAL SORPTION OF URANIUM(VI) BY A BACTERIAL STRAIN ISOLATED FROM A POTENTIAL DISPOSAL SITE
X. Li, L. Du, Z. Huang, Z. Tan, Y. He (China)
- PB4-16** POTENTIAL MICROBIAL EFFECT ON RADIONUCLIDE MIGRATION IN A DEEP GEOLOGICAL REPOSITORY DISPOSAL SYSTEM: MACOTE IN-SITU EXPERIMENT
M. Černík, J. Steinová, D. Dobrev, V. Havlová (Czech Republic)
- PB4-17** THE FATE OF POLYCARBOXYLIC ORGANIC DECONTAMINATION AGENTS IN HIGH pH LOW LEVEL WASTE DISPOSAL
N. Byrd, J. Lloyd, J. Small, F. Taylor, K. Morris (UK)

PB4-18 BINDING OF RADIONUCLIDES ON AGGREGATES OF HUMIC ACID: AGGREGATION KINETICS, SPECTROSCOPIC TECHNIQUES AND MOLECULAR DYNAMIC SIMULATIONS
X. Tan (China)

PB5 FIELD AND LARGE SCALE EXPERIMENTS

PB5-5 LONG TERM IN-SITU DIFFUSION PROJECT (LTD): POST MORTEM ANALYSES OF RADIONUCLIDE PROFILES IN THE ROCK
V. Havlova, E. Hofmanova, R. Posvar, A. Martin, A. Vokal (Czech Republic, Switzerland)

PB5-6 FIXATION OF RADIUM BY ADSORPTION ON CLAY MINERALS BASED ON ANALYSES OF CORE SAMPLES AROUND NINGYOTOGU URANIUM MINE
A. Yamaguchi, Y. Kurihara, M. Okumura, Y. Takahashi (Japan)

PB5-7 MOBILITY OF URANIUM FROM A URANYL PHOSPHATE SOURCE IN LABORATORY TO FIELD SCALE EXPERIMENTS
B. Ferguson, B. Hundley, M. Patel, N. Edayilam, K. Collins, N. Tharayil, B. A. Powell (USA)

PB5-8 UNDERSTANDING THE LONG-TERM BEHAVIOUR AND STABILITY OF U(V) IN MAGNETITE UNDER CONDITIONS RELEVANT TO IN SITU DISPOSAL OF CONTAMINATED LAND
A. E. McNulty, S. Shaw, B. Powell, G. Law, L. Abrahamsen-Mills, J. Rothe, T. Vitova, W. Bower, C. Fallon, H. Roberts, K. Morris (UK, USA, Finland, Germany)

PC1 DATA SELECTION AND EVALUATION**PC1-3 DEVELOPMENT OF A DATABASE FOR RADIONUCLIDE SORPTION IN SUPPORT TO RADIOACTIVE WASTE MANAGEMENT**

D. García, A. Valls, D. Pérez, D. Negro, S. Brassinnes, L. Duro (Spain, Belgium)

PC1-4 VALIDATION OF THERMOCHEMISTRY DATABASE IN CONCENTRATED SALT SYSTEMS: THE Na-Ca-Cl-H₂O SYSTEM

I. Campos, E. Colas, M. Grivé, R. Hibberd, B. Madé, S. Brassinnes, L. Duro (Spain, UK, France, Belgium)

PC2 COUPLING CHEMISTRY AND TRANSPORT**PC2-4 MULTI-COMPONENT REACTIVE TRANSPORT IN A CLAYSTONE: INSIGHTS FROM A TEN-YEAR ALKALINE IN SITU INJECTION EXPERIMENT**

F. Claret, M. Debure, S. Gaboreau, C. Steefel, C. Tournassat, Y. Linard (France, USA)

PC2-5 NUMERICAL MODELING OF NAP GLASS LEACHING IN CONTACT WITH BENTONITE

K. A. Boldyrev, D. V. Kryuchkov, K. V. Martynov, E. V. Zaharova (Russia)

PC2-6 THE PRINCIPLES OF MODELING MIGRATION OF RADIONUCLIDES TAKING INTO ACCOUNT THE SAFETY BARRIERS EVOLUTION

D. V. Kryuchkov, K. A. Boldyrev (Russia)

PC2-7 NUMERICAL MODELING OF LEACHING OF MAGNESIUM POTASSIUM PHOSPHATE MATRIX

K. A. Boldyrev, S. A. Kulikova, P. D. Blinov, D. V. Kryuchkov, S. E. Vinokurov (Russia)

PC3 DEVELOPMENT AND APPLICATION OF MODELS

- PC3-8** COMPLEX MODELING OF STRONTIUM TRANSPORT IN NITRATE SOLUTION
K. A. Boldyrev, I. Kapyrin, A. Safonov, Y. Karaseva, E. Zaharova (Russia)
- PC3-9** NUMERICAL STUDY ON SORPTION KINETICS OF RADIOCESIUM IN FOREST SOIL
H. Kurikami, A. Malins, T. Niizato, K. Iijima, H. Tsukada (Japan)
- PC3-10** MULTI-SITE SURFACE COMPLEXATION MODELLING OF Se(IV) SORPTION ON BIOTITE
X. Li, E. Puhakka, L. Liu, W. Zhang, J. Ikonen, A. Lindberg, M. Siitari-Kauppi (Finland, Sweden)
- PC3-11** APPLICATION OF PARTICLE TRACKING METHOD USING RANDOM WALK SIMULATION FOR RADIONUCLIDE PATHWAY ANALYSIS IN THE GEOLOGICAL REPOSITORY
K. Ishida, K. Fujisaki, H. Saegusa, Y. Takubo, H. Umeki, R. Ota, K. Mitsuyama, H. Takahashi, H. Takase (Japan)
- PC3-12** UNCERTAINTY ON K_d SETTING WITH NUMERICAL SORPTION MODEL
T. Hamamoto, K. Ishida, T. Saito, K. Fujisaki (Japan)
- PC3-13** SORPTION OF RADIONUCLIDES ONTO MINERALS SURFACES: NEW APPROACH TO THE MODELLING
A. Romanchuk, A. Larina, A. Semenkova, V. Svitelman, P. Blinov, S. Kalmykov (Russia)

PC4 MODEL VALIDATION

- PC4-1** OVERVIEW OF MODELLING CHAIN AND DISCUSSION ABOUT INTEGRATED APPROACHES FOR RADIONUCLIDE TRANSPORT SIMULATION
P. Trincherro, E. Abarca, J. Molinero, T. Tanaka, N. Toya (Spain, Japan)

PD APPLICATION TO CASE STUDIES

- PD-18** DISTRIBUTION AND DEPTH PROFILE OF RADIOACTIVE STRONTIUM IN SOIL COLLECTED AROUND FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT
T. Kajiwara, K. Ninomiya, A. Shinohara, Y. Yamaguchi (Japan)
- PD-19** UPWARD MIGRATION OF RADIOCESIUM IN SOIL VIA ABIOTIC PROCESS
F. Sakamoto, N. Kozai, F. Guido-Garcia, T. Kimura, B. Grambow (Japan, France)
- PD-20** LEACHING BEHAVIOUR OF FISSION PRODUCTS AT THE SURFACE OF DEBRIS
T. Sasaki, D. Harumoto, S. Sakamoto, D. Akiyama, A. Kirishima, N. Sato (Japan)
- PD-21** URANIUM SPECIATION IN RADIOACTIVELY CONTAMINATED SOILS FROM THE SUBLIMATE PRODUCTION AREA
I. E. Vlasova, M. A. Maryakhin, V. G. Petrov, A. Yu. Romanchuk, V. O. Yapaskurt, I. A. Presniakov, A. P. Varlakov, G. A. Varlakova, A. L. Trigub, S. N. Kalmykov (Russia)
- PD-22** PLUTONIUM MIGRATION BEHAVIOR AT HANFORD – TRENCH 216-Z-9
S. Hellebrandt, E. Balboni, C. Pearce, V. L. Freedman, A. B. Kersting, M. Zavarin (USA)
- PD-23** FIELD INVESTIGATIONS OF LONGTERM ACTINIDE SOURCE EVOLUTION
M. Zavarin, A. Kersting, B. Powell, Y. Jiao, E. Balboni, C. Pan, S. Hellebrandt, N. Merino, G. Law, D. Kaplan, C. Pearce, V. Freedman (USA, UK)
- PD-24** APPLYING THE COMBINATION OF ^7Be AND ^{137}Cs TO EVALUATE THE EFFECTIVENESS OF SOIL CONSERVATION FOR VETIVER GRASS STRIPS IN CENTRAL HIGHLANDS
S. M. T. Hoang, D. K. Tran (Vietnam)
- PD-25** ELUTION SUPPRESSION OF HAZARDOUS ELEMENTS FROM MUNICIPAL SOLID WASTE INCINERATION FLY ASH BY GEOPOLYMER SODIFICATION MIXED WITH SOIL COMBINING WATER-REPELLENT TREATMENT
T. Takahashi, T. Mizuno, M. Kasari, W. Matsuda, A. Ohbuchi, N. Ogawa, Y. Koike (Japan)

- PD-26** TIME DEPENDENCE OF DISTRIBUTION OF RADIONUCLIDES IN SOIL NEAR THE FUKUSHIMA DAI-ICHI NUCLEAR POWER STATION
K. Fujiwara, T. Sasaki, D. Matoba, K. Iijima (Japan)
- PD-27** MIGRATION BEHAVIOR OF RADIONUCLIDES DEPOSITED IN FOREST NEAR FDNPS: EVALUATION BY ADVECTION DISPERSION MODEL
K. Iijima, K. Fujiwara, D. Matoba, T. Sasaki (Japan)
- PD-28** ESTIMATION OF THE AMOUNT OF I-129 IN THE ENVIRONMENT GENERATED DUE TO THE DECAY OF Te-129m DISCHARGED BY THE FUKUSHIMA NPP ACCIDENT
H. Sato, M. Miyoshi (Japan)
- PD-29** AQUATIC RADIOCHEMISTRY AND SOLUBILITY STUDIES IN SUPPORT OF POTENTIAL EMERGENCY MEASURES FOR THE ASSE II SALT MINE, GERMANY
D. Fellhauer, M. Altmaier, V. Metz, H. Geckeis (Germany)
- PD-30** LICENSE APPLICATION REVIEW OF RADIONUCLIDE RETARDATION PHENOMENA IN UPDATED SAFETY ASSESSMENT FOR EXTENSION OF EXISTING FACILITY FOR FINAL DISPOSAL OF LOW AND INTERMEDIATE LEVEL WASTE (SFR) IN SWEDEN
B. Strömberg (Sweden)
- PD-31** SAFETY ASSESSMENT OF ROKKASHO LOW LEVEL RADIOACTIVE WASTE DISPOSAL FACILITIES
Y. Miyauchi, T. Hamanaka, N. Tamura, T. Kozawa, T. Sasaki (Japan)
- PD-32** RADIOLOGICAL RISK OF NORMS DERIVED FROM USED FILTERS IN THE BOTTLED MINERAL WATER FACILITIES
W. Shin, S. Choung, J.- H. Han, B.- U. Chang (Korea)
- PD-33** THE WORKPACKAGE FUTURE WITHIN THE EU JOINT PROGRAMME EURAD
D. Bosbach, V. Havlova, S. Churakov (Germany, Czech Republic, Switzerland)

- PD-34** SEDIMENT CHARACTERIZATION AND SORPTION STUDIES TO ASSESS URANIUM FATE AND TRANSPORT AT A POTENTIAL SPENT FUEL REPOSITORY SITE IN THE NEGEV DESERT, ISRAEL
M. Dangelmayr, H. Boukhalfa, P. Reimus, R. Harris, D. Ware, F. A. Caporuscio, O. Klein BenDavid, N. Balaban, A. Dody, R. Rosenzweig, P. Reimus, G. Bussod (USA, Israel)
- PD-35** CORI: RESEARCH ON CEMENT-ORGANICS-RADIONUCLIDES-INTERACTIONS WITHIN THE COLLABORATIVE EURAD PROJECT
M. Altmaier, V. Blin, D. Garcia, P. Henocq, T. Missana, D. Ricard, J. Vandenborre (Germany, France, Spain)
- PD-36** DEVELOPMENT AND IMPROVEMENT OF QUALITY ASSURED THERMODYNAMIC UNDERSTANDING FOR USE IN PERFORMANCE ASSESSMENT OF NUCLEAR WASTE DISPOSAL
X. Gaona, B. Grambow, M. Altmaier, L. Duro, D. Bosbach, H. Geckeis (Germany, France, Spain)

WEDNESDAY (18. SEPTEMBER)**SESSION 11 C2: COUPLING CHEMISTRY AND TRANSPORT**

Chair: I. Puigdomènech (Sweden) and P. De Cannière (Belgium)

- 15:00 THE EFFECT OF IONIC STRENGTH ON DIFFUSION IN CLAY. MODELING SOLUTE TRANSPORT AND RETENTION IN THE DR-A EXPERIMENT AT MONT TERRI **C2-1**
J. M. Soler, C. I. Steefel, T. Gimmi, O. X. Leupin, V. Cloet (INVITED) (Spain, USA, Switzerland)
- 15:45 MODELLING THE MOBILITY OF Zn(II) IN ARGILLACEOUS ROCKS AT 21°, 60° AND 80°C USING ADSORPTION MODELS FOR ILLITE AND SMECTITE **C2-2**
S. Savoye, S. Lefevre, C. Lim (France)
- 16:10 REACTIVE TRANSPORT MODELLING FOR SUPPORTING LONG-TERM MONITORING AFTER ENVIRONMENTAL REMEDIATION AT RADIOACTIVELY CONTAMINATED SITES **C2-3**
H. M. Wainwright, D. Ermakova, A. Libera, B. Faybishenko, B. Arora, M. Denham, F. de Barros, K. Lipnikov, D. Moulton, C. Eddy-Dilek (USA)
- 16:35 THREE-DIMENSIONAL MODELLING OF THE LIQUID RADIOACTIVE WASTE INJECTION SITE «SEVERNYI» USING GEOPOLIS SOFTWARE **C2-4**
V. Suskin, I. Kapyrin, A. Rastorguev, V. Konovalov (Russia)
- 17:00 NATURE IS DISCRETE, BUT CONTINUITY IS USEFUL: A REFLECTION ON THE MODELING METHODOLOGIES FOR RADIONUCLIDE TRANSPORT IN DEEP GEOLOGICAL REPOSITORIES IN CRYSTALLINE ROCKS **C2-5**
D. Sampietro, E. Abarca, A. Sáinz-García, P. Trinchero, A. Iraola, J. Molinero (Spain)
- 17:25 BREAK

SESSION 12 A1: SOLUBILITY AND DISSOLUTION

Chair: B. Grambow (France) and D. Reed (USA)

- 17:45 LEACHING OF HOMOGENEOUS MOX PELLETS **A1-1**
($U_{0.73}Pu_{0.27}O_2$) IN CARBONATED WATER AND CLAYEY
GROUNDWATER WITH METAL IRON
*V. Kerleguer, C. Jégou, L. De Windt, V. Broudic,
C. Martin, F. Tocino (France)*
- 18:10 THE IMPACT OF (SUB)MILLIMOLAR **A1-2**
CONCENTRATIONS OF Ca^{2+} ON $Np(V)$ SOLID PHASE
FORMATION IN ALKALINE SOLUTIONS
D. Fellhauer, X. Gaona, M. Altmaier, H. Geckeis (Germany)
- 18:35 EVIDENCES FOR COFFINITIZATION OF UO_{2+x} **A1-3**
SINTERED PELLETS UNDER ANOXIC CONDITIONS
*D. Alby, S. Szenknect, A. Mesbah, J. Lin, L. Duro, M. López-
García, L. Zetterström-Evins, R. C. Ewing, N. Dacheux, J.
Bruno (France, Spain, Sweden, USA)*
- 19:00 ALTERATION OF VITRIFIED INTERMEDIATE LEVEL **A1-4**
NUCLEAR WASTES IN ALKALINE MEDIA: EFFECT OF
CEMENTITIOUS MATERIALS, pH AND
TEMPERATURE
*T. Suzuki-Muresan, A. Abdelouas, C. Landesman, A. Ait-
Chaou, Y. El Mendili, S. Ribet, K. Perrigaud,
D. Shitara, X. Bourbon, C. Martin (France, Japan)*
- 19:25 END OF ORAL SESSIONS OF WEDNESDAY

THURSDAY (19. SEPTEMBER)

9:05 CONFERENCE ANNOUNCEMENTS

SESSION 13 A7: EXPERIMENTAL METHODS*Chair: D. Clark (USA) and W. Cha (Korea)*

- 9.15 ADVANCED STRUCTURAL STUDIES OF ACTINIDE MATERIALS APPLYING HIGH RESOLUTION X-RAY ABSORPTION AND EMISSION SPECTROSCOPY **A7-4**
T. Vitova (INVITED) (Germany)
- 10:00 FAST DEUTERATED WATER DIFFUSION MEASUREMENTS IN CEMENT PASTE, MORTAR AND CONCRETE USING A NMR TECHNIQUE **A7-5**
M. Fleury, T. Chevalier, G. Berthe, W. Dridi, M. Adadji (France)
- 10:25 APPLICATION OF AMS TO ULTRA-LOW LEVELS OF ACTINIDES AND ⁹⁹Tc IN THE ENVIRONMENT **A7-6**
K. Hain, T. Faestermann, F. Gülce, M. Kern, G. Korschinek, M. Martschini, J. Pitters, F. Quinto, A. Sakaguchi, P. Steier, G. Wallner, J. Welch, M. Yamada, R. Golser (Austria, Germany, Japan)
- 10:50 NONDESTRUCTIVE EXTRACTION AND SPECIATION ANALYSIS OF NUCLEAR FUEL PARTICLES FROM ENVIRONMENTAL SAMPLES **A7-7**
M. Weiss, H. Bosco, M. Raiwa, C. M. Fallon, W. R. Bower, P. Warnicke, G. T. W Law, C. Walther (Germany, Finland, UK, Switzerland)
- 11:15 BREAK

SESSION 14 A4: REDOX REACTIONS AND RADIOLYSIS EFFECTS

Chair: S. Clark (USA) and G. Law (Finland)

- 11:35 STRUCTURAL INVESTIGATIONS OF Np_p SORBED ON ILLITE BY M₅-EDGE HR-XANES AND L₃-EDGE EXAFS SPECTROSCOPY **A4-1**
B. Schacherl, C. Joseph, A. Beck, A. Schnurr, F. Rieder, K. Dardenne, D. Fellhauer, E. Bohnert, T. Kupcik, J. Rothe, H. Geckeis, T. Vitova (Germany)
- 12:00 ON REDUCTIVE PRECIPITATION OF MULTIVALENT ELEMENTS ON IRON MATERIALS UNDER ANAEROBIC CONDITIONS **A4-2**
T. Li, H. Yang, L. Wang, D. Cui (China, Sweden)
- 12:25 URANIUM BEHAVIOR IN CALLOVO-OXFORDIAN CLAY ROCK FORMATION; FROM LABORATORY-DERIVED MODELS TO IN-SITU K_D VALUES **A4-3**
G. Montavon, F. Maia, C. Bailly, S. Ribet, C. Lerouge, K. David, B. Madé, M. Lundy, Y. Hassan Loni, M. Grivé, B. Grambow (France, Spain)
- 12:50 BREAK

SESSION 15 B2: DIFFUSION AND OTHER MIGRATION PROCESSES

Chair: M. Siitari-Kauppi (Finland) and U. Alonso (Spain)

- 14:10 DIFFUSIVE TRANSPORT OF STRONGLY SORBING RADIOELEMENTS IN ARGILLACEOUS MEDIA: OLD WINE IN NEW BOTTLES? **B2-1**
M. Glaus, L. Van Loon (INVITED) (Switzerland)
- 14:55 MIGRATION OF CATIONIC, ANIONIC AND NEUTRAL RADIONUCLIDES IN CEMENT-BASED MATERIALS: THE ROLE OF THE CHARGED SURFACES VERSUS THE CHEMICAL DEGRADATION **B2-2**
P. Henocq, S. Gaboreau, T. Sanchez (France, Canada)

- 15:20 WHY MIGRATION EXPERIMENTS WITH A PRESSURE GRADIENT DO NOT ALLOW TO DETERMINE THE ANION ACCESSIBLE POROSITY IN CLAYS **B2-3**
M. Aertsens, N. Maes (Belgium)
- 15:45 ANION EXCLUSION IN CRYSTALLINE ROCKS: THE INFLUENCE OF ROCK STRUCTURE AND PORE NETWORK **B2-4**
V. Havlova, M. Zuna, L. Brázda, T. Rosendorf, J. Sammaljärvi, V. Nenonen, M. Siitari-Kauppi, E. Sasao, L. Gvoždík (Czech Republic, Finland, Japan)
- 16:10 DIFFUSION IN COMPACTED BENTONITE: DO WE HAVE PROCESS UNDERSTANDING? **B2-5**
E. Hofmanová, A. Pecková, R. Červinka, A. Vokál (Czech Republic)
- 16:35 BREAK

SESSION 16 A3: COMPLEXATION WITH INORGANIC AND ORGANIC LIGANDS

Chair: P. Toulhoat (France) and A.Yu. Romanchuk (Russia)

- 16:55 THERMODYNAMIC STUDIES ON THE SOLUBILITY OF ACTINIDES IN THE PRESENCE OF ORGANIC ACIDS RELATED TO GEOLOGICAL DISPOSAL **A3-1**
T. Kobayashi, T. Teshima, P. Wang, T. Sasaki, A. Kitamura (Japan)
- 17:20 URANIUM(VI) COMPLEXATION WITH AQUEOUS SILICATES IN THE ACIDIC TO ALKALINE pH-RANGE **A3-2**
H. Lösch, J. Tits, M. Marques Fernandes, B. Baeyens, I. Chiorescu, S. Krüger, T. Stumpf, N. Huittinen (Germany, Switzerland)
- 17:45 COMPLEXATION OF PROTACTINIUM (V) WITH POLYAMINOCARBOXYLATES **A3-3**
M. Maloubier, C. Le Naour, J. Roques, B. Siberchicot, J. Aupiais, C. Den Auwer, P. Moisy, P.L. Solari (France)

- 18:10 THE FORMATION OF NANOCRYSTALLINE ThO₂:
FROM PRECIPITATION IN AQUEOUS SOLUTIONS TO
THE HIGH-TEMPERATURE TECHNIQUES **A3-4**
*T.V. Plakhova, A.Yu. Romanchuk, A.E. Baranchikov,
R.D. Svetogorov, V.A. Lebedev, A.L. Trigub, E.A. Gerber,
K.O. Kvashnina, V.K. Ivanov, S.N. Kalmykov (Russia, France,
Germany)*
- 18:35 END OF ORAL SESSIONS OF THURSDAY
- 18:40 MOVE TO BANQUET

FRIDAY (20. SEPTEMBER)

9:05 CONFERENCE ANNOUNCEMENTS

SESSION 17 A3: COMPLEXATION WITH INORGANIC AND ORGANIC LIGANDS*Chair: S. Nagasaki (Canada) and X. Gaona (Germany)*

- 9:15 THERMODYNAMICS OF ACTINYL (Np^{V} , Pu^{V} , Pu^{VI}) CARBONATE SYSTEMS BY CAPILLARY ELECTROPHORESIS-ICP-MS FOR ENVIRONMENTAL APPLICATIONS **A3-5**
J. Aupiais, B. Siberchicot, R. Sicre, J. C. Alexandre, N. Dacheux (France)
- 9:40 COMPLEXATION OF U AND Th IN HYDROTHERMAL SOLUTIONS **A3-6**
A. Migdisov, H. Xu, H. Boukhalfa (USA)
- 10:05 CONCLUSIONS FROM THE THERMAC PROJECT – A DEDICATED COLLABORATIVE PROJECT TO INVESTIGATE ACTINIDE CHEMISTRY AT ELEVATED TEMPERATURE CONDITIONS **A3-7**
M. Altmaier, F. Brandt, V. Brendler, I. Campos, N. Cevirim-Papaioannou, I. Chiorescu, E. Colàs, F. Endrizzi, D. Fellhauer, X. Gaona, A. Gray, S. Hagemann, N. Huittinen, C. Koke, D.A. Kulik, S. Krüger, J.-Y. Lee, M. Maiwald, G.D. Miron, P.J. Panak, J. Poonoosamy, A. Skerencak-Frech, R. Steudtner, T. Thoenen (Germany, Spain, Switzerland)
- 10:30 INTERACTION OF RADIONUCLIDES WITH CARBON NANOMATERIALS STUDIED BY BATCH, SPECTROSCOPY AND THEORETICAL CALCULATIONS **A3-8**
X. Wang (China)
- 10:55 COMPLEXATION OF URANIUM(VI) WITH SUBSTITUTED AROMATIC ACIDS IN AQUEOUS SOLUTION **A3-9**
S. Choi, J.-I. Yun (Korea)
- 11:20 BREAK

SESSION 18 B5: FIELD AND LARGE SCALE EXPERIMENTS

Chair: M. H. Baik (Korea) and V. Havlová (Czech Republic)

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| 11:40 | <p>COMPREHENSIVE STUDY OF THE MIGRATION PROPERTY IN REPRESENTATIVE ROCK OF JAPAN AT UNDERGROUND RESEARCH LABORATORIES
<i>T. Iwatsuki, E. Ishii (INVITED) (Japan)</i></p> | B5-1 |
| 12:05 | <p>AN OVERVIEW AND KEY RESULTS FROM THE LONG-TERM IN-SITU DIFFUSION PROJECT (LTD) AT THE GRIMSEL TEST SITE, SWITZERLAND
<i>A. Martin, Y. Fukatsu, Y. Tachi, K. Ishida, E. Muuri, M. Siitari-Kauppi, V. Havlova, A. Vokal, (Switzerland, Japan, Finland, Czech Republic)</i></p> | B5-2 |
| 12:30 | <p>INFLUENCE OF REDOX REACTIONS AND ORGANIC LIGAND COMPLEXATION ON URANIUM, NEPTUNIUM, TECHNETIUM AND PLUTONIUM SUBSURFACE TRANSPORT: UPSCALING LABORATORY EXPERIMENTS TO UNDERSTAND FIELD LYSIMETER DATA
<i>B. A. Powell, R. Dozier, N. Edayilam, K. Peruski, N. Conroy, T. A. DeVol, M. Dogan, B. Ferguson, J. Hundley, D. I. Kaplan, A. Kersting, A. Al Mamun, M. Maloubier, N. Martinez, D. Montgomery, S. Moysey, L. Murdoch, N. Tharayil, M. Zavarin (USA)</i></p> | B5-3 |
| 12:55 | <p>THE CURRENT STATUS OF HLW DISPOSAL IN CHINA AND DIFFUSION AND SORPTION BEHAVIOR OF SELENIUM-75 IN BEISHAN GRANITE AND GMZ BENTONITE
<i>C. Liu, J. G. He, X. Y. Yang, C. L. Wang (China)</i></p> | B5-4 |
| 13:20 | END OF THE CONFERENCE | |