



4-day conference, 7 sessions, 1 technical visit.

Monday November 2.

9:00 10:30: Welcome address

10:30-13:00: SESSION 1 – Migration

Chairs : J. Bruno & Ch. Poinsot

10:30-11:00: Invited speaker 1

11:00-11:30: Invited speaker 2

11:30-11:45: 1.1. “Selenite migration in bentonite and its competition with silicate and pertechnetate.” **Bykov D.**

11:45-12:00: 1.2. “Retention of SeO_3^{2-} and MoO_4^{2-} by Afm phases.” **Ma B.**

12:00-12:15: 1.3. “Effect of pH on the plutonium migration behavior in compacted bentonite.” **Hamada R.**

12:15-12:30: 1.4. “Hydration sequence of swelling clays exchanged with mixed alkali/alkali-earth cations.” **Salles F.**

12:30-12:45: 1.5. “Actinides behavior in the deep LNW disposal in the presence of corrosion products.” **Vlasova I.**

12:45-14:30: LUNCH

14:30-16:30: SESSION 2 – Intermediate Level Waste

Chairs : L. Vance & X. Deschanels

14:30-14:45: 2.1. “Magnesium alloys and graphite wastes encapsulated in cementitious materials: reduction of galvanic corrosion using alkali hydroxide activated blast furnace slag.” **Chartier D.**

14:45-15:00: 2.2. “Behavior of tritium in irradiated nuclear graphite waste: consequences for inventory, decontamination and operational stage of disposal.” **Toulhoat N.**

15:00-15:15: 2.3. “Leaching of UNGG graphite: study of ^{36}Cl behaviour.” **Comte J.**

15:15-15:30: 2.4. “Nuclear decontamination of small and/or complex geometry items using a topping gel concept.” **Gossard A.**

15:30-15:45: 2.5. "Influence of the yield stress on the evolution of a bubble population in a viscoplastic fluid." **Marchal A.**

15:45-16:00: 2.6. "Osmosis: the key process that drives water uptake and swelling of eurobitum bituminized radioactive waste." **Hendrix K.**

16:00-16:15: 2.7. "Modelling of a metallic phase coming from nuclear waste after high temperature treatment." **Laplace A.**

16:15-16:30: 2.8. "Development of materials for the entrapment of radioactive cesium." **Causse J.**

16:30-17:00 COFFEE BREAK

17:00-18:45: SESSION 3 – Corrosion

Chairs : C. Degueldre & L. Claparède

17:00-17:15: 3.1. "Determination of ^{14}C and other activation/fission products in zircaloy-4 cladding from an irradiated UO_2 fuel rod segment." **Herm M.**

17:15-17:30: 3.2. "In situ electrochemical behavior of titanium alloyw (T40, T64) vs. radiolytic corrosion under γ and $^4\text{He}^{2+}$." **Noirault S.**

17:30-17:45: 3.3. "The corrosion of carbon steel in clay porewater at 85°C under stable conditions: results from in situ experiments and implications for nuclear waste repositories." **Schlegel M.**

17:45-18:00: 3.4. "Corrosion considerations related to carbon steel radioactive waste packages exposed to cementitious materials." **Kursten B.**

18:00-18:15: 3.5. "Prediction model for stress corrosion cracking of stainless steel container for nuclear waste disposal." **Nakayama G.**

18:15-18:30: 3.6. "Corrosion processes and microbial activity of carbon steel in the context of geological repository in clay environment." **Necib S.**

18:30-18:45: 3.7. "Corrosion of metallic aluminum in cement matrices." **Delpech S.**

Tuesday November 3.

8:30-9:00: SESSION 4 – Fuel

Chairs : K. Spahiu & Ch. Jégou

8:30-9:00: **Ferry C.** (invited) “Review about the effect of He on the microstructure of spent nuclear fuel in a repository.”

9:00-9:15: 4.1. “Repartition of the uranium isotopes within the Belgian UOX spent fuel.”

Mennecart T.

9:15-9:30: 4.2. “Effect of temperature on the oxidation processes of Pd-doped UO₂ under either hydrogen or argon streams saturated with water vapor.” **Esprui Gascon A.**

9:30-9:45: 4.3. “Dissolution of Th_{1-x}U_xO₂ ceramics: impact of the homogeneity of the cationic distribution.” **Claparède L.**

9:45-10:00: 4.4. “Dissolution of spent nuclear fuel fragments at high alkaline conditions under H₂ overpressure.” **González-Robles Corrales E.**

10:00-10:15: 4.5. “Spent nuclear fuel corrosion studies under Fukushima sea water conditions.” **Serrano D.**

10:15-10:30: 4.6. “Behavior of spent UO₂ TRISO coated particles under repository relevant conditions.” **Curtius H.**

10:30-11:00: COFFEE BREAK

11:00-11:15: 4.7. “The oxidative dissolution of irradiated MOX fuel in aqueous solutions containing H₂O₂.” **Jegou C.**

11:15-11:30: 4.8. “Long term structural stability of self-damaged actinides bearing fuels.” **Dieste Blanco O.**

11:30-11:45: 4.9. “Aqueous leaching of milled high burnup UO₂ fuel under hydrogen atmosphere.” **Puranen A.**

11:45-12:00: 4.10. “Alpha - radiolysis effects on the behavior of spent nuclear fuel under repository conditions characterized by Raman.” **Cobos Sabate J.**

12:00-12:15: 4.11. “Synthesis and solubility of purified coffinite.” **Szenknect S.**

12:15-12:30: 4.12. “Evidences and pathways for UO₂ spent fuel coffinitization from natural analogue studies.” **Bruno J.**

12:30-14:00: LUNCH

14:00-18:00: SESSION 5 – Glass

Chairs : Joe Ryan & Jim Neeway

14:00-14:30: **Matyas J.** (invited) “Challenges and recent advances of vitrification technology for the Hanford Tank Waste Treatment and Immobilization Plant.”

14:30-14:45: 5.1. “Consideration of vitrification process in the formulation of nuclear waste glass.” **Pinet O.**

14:45-15:00: 5.2. “Composition - Structure - Properties relationships of peraluminous glasses.” **Piovesan V.**

15:00-15:15: 5.3. “Chemical diffusion in borosilicate glass melt.” **Pablo H.**

15:15-15:30: 5.4. “Understanding the effect of glass composition containing RE oxide waste glass on liquidus temperature.” **Mohd Fadzil S.**

15:30-15:45: 5.5. “Physico-chemical properties of Chernobyl "lava" as an analogue of aged vitrified HLW.” **Vlasova I.**

15:45-16:00: 5.6. “Radiation effects on high molybdenum bearing heterogeneous borosilicate waste glasses.” **Patel K.**

16:00-16:30: COFFEE BREAK

16:30-16:45: 5.7. “Current state of knowledge on nuclear glass corrosion and remaining challenges.” **Gin S.**

16:45-17:00: 5.8. “Zeolite seeded experiments provide key parameters for modeling nuclear glass alteration resumption.” **Fournier M.**

17:00-17:15: 5.9. “Impact of Zn, Mg, Ni and Co on the glass leaching: cumulative or competitive effects?” **Arena H.**

17:15-17:30: 5.10. “New methods for alpha dose rate profile determination at HLW matrix / water interfaces.” **Tribet M.**

17:30-17:45: 5.11. “The effect of electron irradiation on the structure of sodium aluminum iron phosphate glasses.” **Stefanovsky S.**

19:30-22:00 POSTER SESSION

Wednesday November 4.

8:30-11:30: SESSION 2 – ILW

Chairs : A. Mesbah & S. Neumeier

8:30-9:00: **Granjean A.** (invited) “Innovative materials designed for solid phase extraction processes applied for decontamination of nuclear liquid wastes.”

9:00-9:15: 2.9. “Immobilisation process for contaminated zeolitic ion exchangers from Fukushima.” **Pletser D.**

9:15-9:30: 2.10. “Capture of radionuclides in porous metal organic frameworks (MOFs).” **Volkringer C.**

9:30-9:45: 2.11. “Structural characterization of geopolymers for the safe disposal of the fission products ^{137}Cs and ^{90}Sr .” **Weigelt S.**

9:45-10:00: 2.12. “Modifications under electron irradiations of functionalized mesoporous silica for the confinement of iodine and caesium.” **Deschanel X.**

10:00-10:30: COFFEE BREAK

10:30-10:45: 2.13. “Performance of promising porous materials on the capture of radionuclides.” **Alby D.**

10:45-11:00: 2.14. “Synthesis of core shell nanoparticles to capture radioactive cesium.” **Mansas C.**

11:00-11:15: 2.15. “Why should CEM III/C cement be preferred to CEM I cement for cationic exchange resins encapsulation?” **Lafond E.**

11:15-11:30: 2.16. “Synthesis of calcium mono-uranate particles via an aqueous route.” **Ding W.**

11:30-12:30: SESSION 1 – Migration

Chairs : S. Szenknect & S. Schumacher

11:30-11:45: 1.6. “Demonstration of the existence of favorable hydrogeological/hydrochemical environments of HLW disposal.” **Kunimaru T.**

11:45-12:00: 1.7. “Categorisation and geological/ hydrogeological modelling of potential host rock environments in Japan.” **Ota K.**

12:00-12:15: 1.8. “Long term safety of the extended SFR - Methodology and conclusions from the SR-PSU project.” **Vahlund F.**

12:15-12:30: 1.9. “Application of solubility and transport limited radionuclide release in performance assessment of a spent fuel repository in Boom clay.” **Yu L.**

12:30-14:30: LUNCH

14:30-14:45: 1.10. “Assessing the impact of repository construction and operation on the performance of the host rock as a barrier - case study: deep geological repository at Olkiluoto.” **Hellä P.**

14:45-15:00: 1.11. “A thermodynamic analysis on the swelling stress of Na-Bentonite under various solution conditions.” **Sato H.**

15:00-15:15: 1.12. “Microstructural features of compacted MX-80 bentonite after 15 years long experiments.” **Matuszewicz M.**

15:15-15:30: 1.13. “Matrix pore water study on Olkiluoto veined gneiss and pegmatic granite from structural perspective.” **Sammaljärvi J.**

15:30-17:45: SESSION 5 – Glass

Chairs : J. Matyas & S. Gin

15:30-16:00: **Neeway J.** (invited) “Diffusion of lithium through a mature glass alteration layer?”

16:00-16:15: 5.12. “The effects of temperature in the aqueous corrosion of UK nuclear waste glass.” **Fagcang H.**

16:15-16:30: 5.13. “Development of performance assessment models for glass dissolution.” **Goto T.**

16:30-16:45: 5.14. “Towards a mechanistic understanding of UK Magnox waste glasses dissolution: A NMR approach for alteration surface characterization.” **Guo R.**

16:45-17:00: 5.15. “Alteration layer formed during nuclear glass leaching by water: effects of irradiation on structure and formation mechanisms.” **Mougnaud S.**

17:00-17:15: 5.16. “Hydration induced morphological evolution at glass-liquid interfaces: a new model of long-term glass corrosion.” **Ryan J.**

17:15-17:30: 5.17. “Degradation of international simple glass in cracks.” **Rama Krishna C.**

20:00-23:00 BANQUET (19:30 departure of the bus from the Pullman hotel to the domaine de Verchant)

Thursday November 5.

9:00-12:00 : SESSION 6 – Ceramic materials

Chairs : D. Gregg & N. Clavier

9:00-9:30: **Raison P.** (invited) “Cubic zirconia based materials prepared from spent fuel LWR rod treatment.”

9:30-9:45: 6.1. “Wasteforms for waste from advanced reprocessing.” **Hsieh Y.H.**

9:45-10:00: 6.2. “Optimisation of processing parameters for the consolidation of actinide glass-ceramic wasteforms by hot isostatic pressing.” **Thornber S.**

10:00-10:15: 6.3. “Progress on a synroc waste treatment plant for intermediate-level liquid waste from reactor production of ⁹⁹Mo.” **Gregg D.**

10:15-10:30: 6.4. “Sol-gel preparation of Ce, U and Pu brannerites.” **Vance L.**

10:30-11:00 : COFFEE BREAK

11:00-11:15: 6.5. “Synthetic analogues of kosnarite mineral as waste forms for the immobilization of actinides and fission products.” **Bykov D.**

11:15-11:30: 6.6. “Ba substitution in CsAlSi₂O₆ pollucite and leaching behaviour of Cs₂TiSi₆O₁₅.” **Vance L.**

11:30-11:45: 6.7. “Synthesis and structural characterization of Sm_x(Ca,Th)_{1-x}PO₄ and Sm_x(Ca,U)_{1-x}PO₄ solid solutions.” **Schlenz H.**

11:45-12:00: 6.8. “Structural peculiarities of aged ²³⁸Pu doped REE monazites.” **Shiryaev A.**

12:00-14:00: LUNCH

14:00-18:00 BMBF session

14:00-14:15 B1. “Conditioning of long-lived radionuclides in ceramic waste forms – A German joint research project.” **S. Neumeier, D. Bosbach**

14:15-14:30 B2. “Structural and vibrational characterization of (La,Pr)PO₄ monazite.” **A. Hirsch**

14:30-14:45 B3. “The crystal structure of the rhabdophane compounds REEPO₄ . 0.667 H₂O.” **A. Mesbah**

14:45-15:00 B4. "Structural studies on rhabdophane-monazite phase transition in (La,Eu)PO₄." **Y. Arinicheva**

15:00-15:15 B5. "Pu(III) monazite: synthesis, structure, and characterization." **K. Popa**

15:15-15:30 B6. "Incorporation of Cm³⁺ and Eu³⁺ in LnPO₄ ceramics – A site-selective TRLS study." **N. Huittinen**

15:30-15:45 B7. "Structural stability study of the mixed La_{0.7-x}Lu_xEu_{0.3}PO₄ solid solutions by Extended X-ray Absorption Spectroscopy." **M.J. Lozano-Rodriguez**

15:45-16:15 COFFEE BREAK

16:15-16:45 **D. Gregg** (invited) "Ceramic waste forms in nuclear waste management applications: Status and perspective."

16:45-17:00 B8. "Sintering behaviour and microstructure of rare earth phosphates REPO₄ (with RE =La, Ce, Pr)." **C. Schausten**

17:00-17:15 B9. "Physical and microstructural properties of monazite-type ceramics." **A. Thust**

17:15-17:30 B10. "Study of dissolution of monazite: kinetic point of view." **C. Gausse**

17:30-17:45 B11. "Leaching of plutonium from "old" samples of single-phase ceramics based on (Zr_{0.79}Gd_{0.14}Pu_{0.07})O_{1.99} and (La_{0.9}Pu_{0.1})PO₄ doped with ²³⁸Pu." **B. Zubekhina**

17:45-18:00 B12. "In-situ structural investigations on monazite-type La_{0.2}Gd_{0.8}PO₄ under heavy ion irradiation." **S. Neumeier**

Friday November 6.

8:00-18:00: Technical visit of CEA research center of Marcoule (transfer by bus)

8:00 : Bus departure from the Pullman hotel, Montpellier

Visit of the Atalante facility, vitrification and long-term behavior laboratories & decommissioning exhibition.

18:00 : Bus return at the Pullman hotel, Montpellier

POSTERS

SESSION 1 - Migration

- P1.1 “The laboratory models for EPSP experiment in DOPAS project - the comparison of saturation of bentonite pellets and bentonite powder.” Trpkosova D.
- P1.2 “Evaluation for influence of new volcanic eruption on geological disposal site.” Shimada T.
- P1.3 “A thermodynamic analysis on the effect of salinity on interlayer space of Na-montmorillonite.” Sato H.
- P1.4 “Comparison of titration methods used in characterization of barrier materials type of bentonite.” Adam R.
- P1.5 “Information on pore structure from various through diffusion experiments.” Voutilainen M.
- P1.6 “Sorption of radionuclides on the rocks of the exocontact zone of Nizhnekansky granitoid massif (Eniseysky area).” Vlasova I.
- P1.7 “Radionuclide migration from the fracture towards granitic rock matrix.” Zuna M.
- P1.8 “Diffusion of conservative tracers in Grimsel rock samples.” Videnska K.

SESSION 2 - ILW

- P2.1 “Hydatation effect on H₂ emission in ion exchange resin irradiated at high energy heavy ions.” Boughattas I.
- P2.2 “Hydration of Eurobitum bituminized waste under free swelling conditions : osmosis-induced swelling and NaNO₃ leaching.” Bleyen N.
- P2.3 “Processing of irradiated graphite : the outcomes of IAEA coordination research project.” Ojovan M.

SESSION 3 - Corrosion

- P3.1 “Corrosion of zircaloy and steel measured by a TGA with water vapor furnace and capillary MS coupling.” Post E.

SESSION 4 - Fuel

- P4.1 “Study of fission products solubility in liquid Pb by DFT approach.” Cerini M.
- P4.2 “Welcome to the new surface science lab station to study the corrosion processes of the spent fuel, its electronic and structural properties.” Eloirdi R.
- P4.3 “In-situ temperature X-ray diffraction study of the Am-O system.” Epifano E.
- P4.4 “Interaction of ice with the surface of actinide oxides films under UV light studied by Ultra-Violet and X-ray photoelectron spectroscopy.” Cakir P.
- P4.5 “Effect of fission products on the dissolution of uranium dioxide.” Cordara T.

SESSION 5 - Glass

- P5.1 “Magnetic behavior of alumina borosilicate glasses by Mossbauer spectroscopy.” Sobolev A.
- P5.2 “Impact of crystallization of apatite on the structure and chemical durability of borosilicate glass.” Nicoleau E.
- P5.3 “Oxidation state and coordination of iron in sodium aluminum iron phosphate glasses.” Presniakov I.
- P5.4 “XAFS study of iron and nickel speciation in complex sodium alumniophosphate based nuclear waste glasses.” Stefanovsky S.
- P5.5 “Dissolution kinetics of apatite in simplified sodium-borosilicate glass.” Renaud J.
- P5.6 “Vitrification of simulated highly active calcines containing high concentrations of sodium and molybdenum.” Harrison M.
- P5.7 “PCT releases versus glass composition: develop mathematical model and identify a PCT-based durability threshold within the composition space.” Farooqi R.U.
- P5.8 “Vitreous materials for nuclear waste immobilisation - IAEA support activites.” Robbins R.
- P5.9 “Uranium behavior in silicate glass synthesized in reducing conditions” Chevreux P.

SESSION 6 - Ceramic materials

- P6.1 “A study of sodalite pellets as matrix for spent salts confinement.” Giacobbo F.
- P6.2 “Candidate waste forms for the immobilization of highly enriched uranium waste streams from fission-based ⁹⁹Mo production.” Gregg D.

- P6.3 “Synthesis and characterization of $\text{Ln}_{1-2x}\text{Ca}_x\text{Th}_x\text{PO}_4 \cdot n\text{H}_2\text{O}$ rhabdophane-type precursors to monazite” Clavier N.

SESSION 7 - Separative chemistry

- P7.1 “Application of time resolved chemiluminescence laser spectroscopy for detection of actinides and lanthanides in solutions.” Izosimov I.
- P7.2 “Efficient extractants of f-elements, derived by decoration of pyridine platform.” Korotkov L.

BMBF session

- PB.1 “A computational study of heavy ion irradiation of phosphate ceramics” Filby A.
- PB.2 “Solubility of Lanthanide-phosphates (LnPO_4) and aqueous Lanthanide-speciation under repository-relevant conditions.” Deissmann G.