### General timetable

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Oral SESSIONS

SEPTEMBER 17...20, 2007
LILLE
3rd INTERNATIONAL MEETING
MONDAY SEPTEMBER 17, morning

Auditorium Pasteur

10 h 00 - 11 h 00 → OPENING CEREMONY

SESSION 01  OPENING LECTURES

Chair: Patrick Landais

11 h 00 - 11 h 30 → The Meuse/Haute-Marne Underground Research Laboratory: seven years of scientific investigations
O/01/1 J. Delay, P.L. Forbes, J. Roman
Andra, France

11 h 30 - 12 h 00 → CLAYTRAC project: evaluation of tracer profiles across argillaceous formations
O/01/2 M. Mazurek1, P. Alt-Epping1, A. Bath2, S. Buschaert3, A. Gautschi4, T. Gimmi1, H. N. Weber1
1 Institute of Geological Sciences, University of Bern, Switzerland /2 Intellisci, UK /3 Andra, France /4 Nagra, Switzerland

12 h 00 - 12 h 30 → Correspondence between sorption measured on compacted and dispersed systems and sorption model predictions
O/01/3 M.H. Bradbury, B. Baeyens
P. Scherrer Institute, Laboratory for Waste Management, Switzerland

12 h 30 - 13 h 00 → Clay seals in CO₂ storage
O/01/4 J.P. Gerling1, B.M. Krooss2, A. Busch2, H.D. Vosteen1, K. Reinhold1
1 BGR, Germany /2 RWTH, Aachen University, Germany

13 h 00 - 14 h 20 → Lunch (Espace Jeanne de Flandre)

14 h 20 - 15 h 00 → POSTER SESSION (Espace Flandres)

Remark: Full organisations names and authors addresses are available in the book of abstracts.
MONDAY SEPTEMBER 17, afternoon

Auditorium Pasteur

SESSION 02A GENERAL STRATEGY / CLAY BASED CONCEPTS
Chair: Jean-Paul Minon / Alan Hooper

15 h 00 - 15 h 20 ➔ Ontario Power Generation’s proposed deep geologic repository for low
and intermediate level radioactive waste, Bruce site, Ontario, Canada
O/02A/1
M.R. Jensen, F.K. King
Ontario Power Generation, Ontario, Canada

15 h 20 - 15 h 40 ➔ Design and realisation of the PRACLAY experimental gallery at the
Hades URF
O/02A/2
W. Bastiaens, F. Bernier
EIG Eureka, Belgium

15 h 40 - 16 h 00 ➔ Extension of the Mont Terri Rock Laboratory and experiment
programme
O/02A/3
P. Bossart1, H. J. Alheid2, J. Delay3, E. Frank4, M. Hugi5, K. Kih6, T. Rothfuchs7
1Swisstopo, Switzerland / 2BGR, Germany / 3Andra, France / 4HSK, Switzerland / 5Nagra, Switzerland / 6Cnpi, Japan / 7GRS, Germany

16 h 00 - 16 h 20 ➔ European bentonites as alternatives to MX-80
O/02A/4
D. Koch
S&B Industrial Minerals GmbH, Germany

Coffee break

SESSION 03A LARGE SCALE GEOLOGICAL CHARACTERISATION
Chair: Andreas Gautschi / Hervé Chamley

16 h 50 - 17 h 10 ➔ Seismic imaging of the variability in the Callovo-Oxfordian argillite
O/03A/1
D. Guillemet, B. Yven
Andra, France

17 h 10 - 17 h 30 ➔ Identification of homogeneous zones from well logging measurements
by statistical tools
O/03A/2
A. Marache1, J. Riss1, A. Denis1, B. Yven2, A. Trouiller2
1University Bordeaux 1, France / 2Andra, France

17 h 30 - 17 h 50 ➔ Geostatistical characterization of Callovo-Oxfordian clay variability
from high resolution log data
O/03A/3
M. Lefranc1,2, B. Beaudoin3, J.P. Chilès2, D. Guillemet1, C. Ravenne3, A. Trouiller1
1Andra, France / 2Ecole des Mines de Paris, France / 3Institut Français du Pétrole, France

17 h 50 - 18 h 10 ➔ Magnetic properties, magnetic mineralogy and fabric of the argillites
of the Meuse/Haute-Marne URL
O/03A/4
J.L. Bouchez1, L. Esteban1,2,3,4, Y. Géraud2, A. Trouiller3, R. Siqueira1
1University Toulouse, France / 2University Strasbourg, France / 3Andra, France / 4Geological Survey of Canada-Pacific, Canada
15 h 00 - 15 h 20 → **Long-term geochemical evolution of the near field of a KBS-3 HLNW repository: insights from reactive transport modelling**

D. Arcos\(^1\), F. Grandia\(^1\), C. Domènech\(^1\), P. Sellin\(^2\)

\(^1\)Enviros, Spain / \(^2\)SKB, Sweden

15 h 20 - 15 h 40 → **Investigation of iron transport into bentonite from anaerobically corroding steel: a geochemical modelling study**

F.M.I. Hunter\(^1\), F. Bate\(^1\), T.G. Heath\(^1\), A. Hoch\(^1\), L.O. Werme\(^2\)

\(^1\)Serco Assurance, United Kingdom / \(^2\)SKB, Sweden

15 h 40 - 16 h 00 → **Se\(_2\)O\(_4\)\(^2-\) adsorption on conditioned Na-illite: XAS spectroscopy, kinetics, surface complexation model and influence of compaction**

C. Bruggeman\(^1\), A. Maes\(^1\), G. Montavon\(^2\), E. Breynaert\(^1\), Z. Guo\(^2\), J. Vancluyssen\(^1\)

\(^1\)Katholieke Universiteit Leuven, Belgium / \(^2\)École des Mines de Nantes, France

16 h 00 - 16 h 20 → **Influence of temperature and gamma-irradiation on the anion sorption capacity of modified bentonites**

B. Riebe, C. Bunnennberg, A. Meleshyn, S. Dultz

Leibniz University Hannover, Germany

**Coffee break**

16 h 50 - 17 h 10 → **In-situ thermal experiments carried out in Opalinus clay and Callovo-Oxfordian claystones by Andra**

Experiment set-up and measurement results

Y. Wileveau, K. Su

Andra, France

17 h 10 - 17 h 30 → **Characterization of the THM parameters of Callovo-Oxfordian mudstone by interpretation of an in-situ heating test**

B. Garitte\(^1\), A. Gens\(^1\), J. Vaunat\(^1\), Y. Wileveau\(^2\)

\(^1\)Technical University of Catalonia, Spain / \(^2\)Andra, France

17 h 30 - 17 h 50 → **Temperature buffer test experimental and model results**

M. Åkesson\(^1\), A. Jacinto\(^2\), A. Ledesma\(^2\), M. de Combarieu\(^3\)

\(^1\)Clay Technology AB, Sweden / \(^2\)Technical University of Catalonia, Spain / \(^3\)Andra, France

17 h 50 - 18 h 10 → **Dismantling of the mock-up-CZ experiment**

J. Pacovský, J. Svoboda, R. Vasiczek

Faculty of Civil Engineering, Prague, Czech Republic
SESSION 04   GAZ AND LIQUID TRANSFER  
Chair: Paul Marschall / Scott Altmann

8 h 30 - 8 h 50 → Gas migration through bentonite/sand: Lessons learned from the GMT in-situ test
O/04/1
T. Shimura1, S. Vomvoris2, G.W. Lanyon3, P. Marschall2, K. Ando4, S. Yamamoto4, H. Asano1
1RWMC, Japan / 2 Nagro, Switzerland / 3 Fracture Systems Ltd, Japan / 4 Obayashi Corporation, Japan

8 h 50 - 9 h 10 → Modeling approaches of two-phase flow phenomena associated with corrosion of SF/HLW canisters in a proposed repository in Opalinus clay, Switzerland
O/04/2
R. Senger1, T. Xu2, P. Marschall3, S. Finsterle2
1Intera Incorporated, USA / 2 Lawrence Berkeley National Laboratory, USA / 3 Nagro, Switzerland

9 h 10 - 9 h 30 → Approaches for modelling gas transport in clay formations based on improved Darcy and non-Darcy flow concepts
O/04/3
H. Alkan, W. Müller
Institute for Safety Technology (ISTEC), Germany

9 h 30 - 9 h 50 → Deriving large scale hydraulic behaviour from borehole pressure history data
O/04/4
C. Enachescu, J. Delay, M. Cruchaudet, R. de la Vaissiere
Andra, France

9 h 50 - 10 h 10 → Interpretation of interstitial pressures in clay media: Application to the Callovo-Oxfordian
O/04/5
P. Rousseau-Gueutin1,2, J. Gonçalvès1, M. Cruchaudet2, S. Altmann2, V. de Gref2, S. Violette1
1UMR 7619 Sisyphe, Paris, France / 2 Andra, France / 3 UMR 7649 LMS, France

10 h 10 - 10 h 30 → Porosities accessible to HTO and iodide on water-saturated compacted clay materials and relation with the states of water
O/04/6
G. Montavon1, E. Alhajj1, D. Lebotian2, Z. Guo1, C. Tournassat3, B. Grambow2
1Subatech, France / 2 LAEM, France / 3 BRGM France

→ Coffee Break
SESSION O5  PORE-WATER CHEMISTRY
Chair: Pedro Hernan / Catherine Beaucaire

11 h 00 - 11 h 20  \rightarrow CO₂ data on gas and porewater sampled in-situ in the Opalinus clay at the Mont Terri rock laboratory
O/05/1
A. Vinsot¹, C.A.J. Appelo², C. Cailletau³, ⁴, ⁵, S. Mettler⁶, P. Wersin⁶, P. De Cannière⁷, H.-E. Gäßler⁸
¹Andra, France / ²MB Amsterdam, The Netherlands / ³LEMC, ENSEC/INPL, France / ⁴GIR-CREGU, CNRS, France / ⁵Andra, France / ⁶Nagra, Switzerland / ⁷SCK-CEN, Belgium / ⁸BRGM, Germany

11 h 20 - 11 h 40  \rightarrow Improvements in the modelling of the porewater chemistry of the Callovo-Oxfordian formation
O/04/2
E.C. Gaucher¹, C. Tournassat¹, E. Jacquot², S. Altmann², A. Vinsot²
¹BRGM, France / ²Andra, France

11 h 40 - 12 h 00  \rightarrow Nature and reactivity of dissolved organic matter in the Opalinus clay and Callovo-Oxfordian formations
O/05/3
A. Courdouan¹, I. Christl¹, P. Wersin², R. Kretzschmar¹
¹Institute of Biogeochemistry and Pollutant Dynamic, Switzerland / ²Nagra, Switzerland

12 h 00 - 12 h 20  \rightarrow PH₄: a 250 m deep borehole in Tournemire for assessing the reliability of chloride, helium and water stable isotopes profiles in the Toarcian/ Domerian shales
O/05/4
S. Savoye¹, J.L. Michelot², H.N. Weber³, J.M. Matray¹, F. Benesnouci¹,², Ch. Wittebroodt¹,², J. Cabrera¹
¹IRSN, France / ²UMR IDES CNRS-University Paris-Sud, France / ³Rock-Water Interaction, Switzerland / ⁴IMSE, University Montpellier 2, France

12 h 20 - 12 h 40  \rightarrow Development of a new facility for dating old groundwaters by using¹⁸⁻¹⁹Kr
O/05/5
B. Lavieille¹, E. Gilbert¹, B. Thomas¹, V. Lavastre¹,²
¹University Bordeaux 1-2, France / ²University Nimes, CNRS, France

12 h 40 - 14 h 00  \rightarrow Lunch (Espace Jeanne de Flandre)

14 h 00 - 15 h 00  \rightarrow POSTER SESSION (Espace Flandres)
TUESDAY SEPTEMBER 18, afternoon
Auditorium Pasteur

SESSION 06A THERMAL AND OXIDATION EFFECTS
Chair: Anna Maria Fernandez / Norbert Clauer

15 h 00 - 15 h 20 → Alteration processes in bentonites; mineralogical and structural changes during long-term and short-term experiments
O/06A/1
J. Adamcová1,2, I. Kolaříková1
1 Institute of Geochemistry, Faculty of Science, Czech Republic / 2 Czech Geological Survey, Czech Republic

15 h 20 - 15 h 40 → Implications from the lot experiment regarding the selection of an optimum HLRW bentonite
O/06A/2
S. Kaufhold1, R. Dohrmann1,2
1 BGR, Germany / 2 LBEG, State Authority for Mining, Energy, and Geology, Germany

15 h 40 - 16 h 00 → Extent of oxidation in Boom clay as a result of excavation and ventilation of the HADES URF: Experimental and modelling assessments
O/06A/3
M. De Craen1, M. Van Geet1,2, M. Honty1, L. Wang1, E. Weetjens1
1 SCK-CEN, Belgium / 2 ONDRAF/NIRAS, Belgium

16 h 00 - 16 h 20 → Magnetic and mineralogical alterations under thermal stress at 95°C of Callovo-Oxfordian claystones (Bure, France) and lower Dogger Mont Terri claystones (Switzerland)
O/06A/4
J.P. Pozzi1, C. Aubourg2, D. Janots1, M. Cathelineau3, N. Clauer4, D. Rousset3, R. Ruck3, N. Lieuwig2, I. Tcher1
1 CNRS, France / 2 CNRS, France / 3 CNRS G2R, France / 4 CNRS CGS, France / 5 CNRS Institut Pluridisciplinaire, France / 6 CNRS Cérèje, France

Coffee break

SESSION 07A IRON CLAY INTERACTIONS
Chair: Reiner Dohrmann / Michel Cathelineau

16 h 50 - 17 h 10 → Effects of temperature, pH, iron/clay ratio and liquid/clay ratio on the conversion of di-octahedral smectite into iron-rich clays: a review of experimental studies
O/07A/1
M. Cathelineau1, R. Mosser–Ruck1, D. Rousset1, D. Guillaume2, D. Charpentier3, K. Devineau5, F. Villieras2, N. Michau5
1 Géologie et Gestion des Ressources Minérales et Énergétiques, France / 2 LMTG, UMR 5563 CNRS-UPS-IRD, France / 3 Département de Géosciences, University Franche-Comté, France / 4 Laboratoire Environnement et Minéralogie, Institut National Polytechnique de Lorraine, France / 5 Andra, France

17 h 10 - 17 h 30 → Modelling iron/bentonite interactions
O/07A/2
D. Savage1, C. Watson1, S. Benbow1, J. Wilson2
1 Quintessa Ltd, UK / 2 Health Protection Agency, UK

17 h 30 - 17 h 50 → Impact of iron on the bentonite buffer within the KBS-3H disposal concept: results from reactive transport modelling
O/07A/3
P. Wersin1, M. Birgersson2, M. Snellman3
1 Nagra, Switzerland / 2 Clay Technology, Sweden / 3 Saano & Riekko Oy, Finland

17 h 50 - 18 h 10 → Characterization of a redox-modified clay mineral with respect to its suitability as a barrier in radioactive waste confinement
O/07A/4
A.S. Anastácio1, A. Aoud1, P. Sellin2, J. W. Stucki1
1 Department of Natural Resources and Environmental Sciences, University of Illinois, USA / 2 SKB, Sweden
SESSION 06B  HYDRO MECHANICAL PROCESSES – 1
Chair: Charles Fairhurst / Tilmann Rothfuchs

15 h 00 - 15 h 20 → Three-dimensional and time stepping modelling of the whole Meuse/
Haute-Marne Andra URL
F. Laouafa¹, J.-B. Kazmierczak¹, G. Armand², J. Vaunat³, M. Jobmann⁴, M. Polster⁴
¹ INERIS, France / ² Andra, France / ³ UPC-Technical University Catalonia, Girona, Spain / ⁴ DBETEC-DBE Technology GmbH, Germany

15 h 20 - 15 h 40 → Constitutive model for a deep argillaceous rock using Hoek-Brown
criteria
K. Su¹, C. Chavant², M. Souley³
¹ Andra, France / ² EDF, France / ³ INERIS, France

15 h 40 - 16 h 00 → Long term behaviour of the Boom clay: influence of viscosity
on the pore pressure distribution
C. Coll¹, R. Charlier¹, X.L. Li², F. Collin¹
¹ University Liège, Belgium / ² ESV EURIDICE, SCK CEN, Belgium

16 h 00 - 16 h 20 → Microstructural changes induced by viscoplastic deformations
in argillaceous rocks
P.L. Pellet¹, S. Fabre¹, K. Su², P. Lebon²
¹ University Joseph Fourier, France / ² Andra, France

→ Coffee break

SESSION 07B  HYDRO MECHANICAL PROCESSES – 2
Chair: Christian Schroeder / Mehdi Ghoreychi

16 h 50 - 17 h 10 → The engineered barrier experiment at Mont Terri rock laboratory
J.-L. García-Siñeriz¹, M. Rey¹, J.-C. Mayor²
¹ AITEMIN, Spain / ² ENRESA, Spain

17 h 10 - 17 h 30 → Chemical influence on the Hydro-Mechanical behaviour
of high-density FEBEX bentonite
E. Castellanos¹, M.V. Villar², E. Romero¹, A. Lloret¹, A. Gens¹
¹ University Politècnica de Catalunya, Spain / ² CIEMAT, Spain

17 h 30 - 17 h 50 → Influence of water exchanges on the gallery convergence
P. Gerard¹, R. Charlier¹, R. Chambon², F. Collin¹
¹ University Liège, Belgium / ² Laboratoire 3S, CNRS, France

17 h 50 - 18 h 10 → New method for ageing resistant storage of argillaceous rock samples
to achieve reproducible experimental results even after long intermediate storage times
O. Czaikowski, K.-H. Lux
Clausthal University, Germany
SESSION 08  TRANSPORT PROCESSES & MODELLING
Chair: Joseph Stucki / Christophe Poinsot

8 h 30 - 8 h 50 → Anion exclusion effects in compacted bentonites: towards a better understanding of anion diffusion
0/08/1
L. R. Van Loon, Martin A. Glaus, Werner Müller
Paul Scherrer Institut, Switzerland

8 h 50 - 9 h 10 → High performance FVFE multidomain numerical method. Application to radionuclide transport through geological layers
0/08/2
M. Dymitrowska, M. Bourgeois, G. Mathieu
IRSN, France

9 h 10 - 9 h 30 → Impact of bentonite extrusion on radionuclide migration in a saturated planar fracture
0/08/3
R. A. Borrelli, J. Ahn
Department of Nuclear Engineering, University of California, USA

9 h 30 - 9 h 50 → The DI-B in-situ diffusion experiment at Mont Terri: results and modelling
0/08/4
1 ICTJA-CSIC, Spain / 2 University A Coruña, Spain / 3 Ciemat, Spain / 4 Enresa, Spain / 5 Nagra, Switzerland

9 h 50 - 10 h 10 → In-situ diffusion test in Opalinus clay with tritium, anionic and cationic tracers: comparison with laboratory experiments and modelling
0/08/5
1 Nagra, Switzerland / 2 CSIC-IJIA, Spain / 3 PSI, Switzerland / 4 Andra, France

10 h 10 - 10 h 30 → Osmotic experiment at the Meuse/Haute-Marne URL (France)
0/08/6
M. Cruchaudet1, J. Croisè2, J.M. Lavanchy2
1 Andra, France / 2 Colenco Power Engineering AG, Switzerland

→ Coffee Break
SESSION 09  EXCAVATION DAMAGED ZONE - 1
Chair: Peter Blumling / Jean-François Aranyossy

11 h 00 - 11 h 20  ➔ Autochthonous and colonizing microorganisms in argillaceous underground environments
O/09/1
S. Poulain1,2, C. Sergeant1, C. Le Marrec3, M.-H. Vesvres1, A. Vinsot2, S. Dewonck2, M. Simonoff1, S. Aitmann2
1 University Bordeaux, CNRS, GdR FORPRO, France / 2 Andra, France / 3 STAB, University Bordeaux I, INRA, France

11 h 20 - 11 h 40  ➔ Discrete fracture network modelling of the Hg-a experiment at the Mont Terri rock Laboratory
O/09/2
G. W. Lanyon1, P. Marshall2, T. Vietor2
1 Fracture Systems Ltd, UK / 2 Nagra, Switzerland

11 h 40 - 12 h 00  ➔ Discrete modelling of drift behaviour in the Meuse/Haute-Marne URL (France)
O/09/3
C. Bourdeau, F. Dedecker, D. Billaux
ITASCA Consultants, France

12 h 00 - 12 h 20  ➔ Fracturation in Callovo-Oxfordian argillite under triaxial compression studied by X-ray microtomography
O/09/4
N. Lenoir1,2, J. Desrues1, G. Viggiani1, P. Bésuelle1, M. Bornert3, J.D. Barnichon2
1 Laboratoire 3S-R, France / 2 Andra, France / 3 Laboratoire de Mécanique des Solides, Ecole Polytechnique, France

12 h 20 - 12 h 40  ➔ A general review of the damage models for the EDZ creation
O/09/5
C. Arson1, B. Gatmiri1,2
1 CERMES, France / 2 University of Tehran, IRAN

12 h 40 - 14 h 00  ➔ Lunch (Espace Jeanne de Flandre)

14 h 00 - 15 h 00  ➔ POSTER SESSION (Espace Flandres)
WEDNESDAY SEPTEMBER 19, afternoon

Auditorium Pasteur

→

SESSION 10A  EXCAVATION DAMAGED ZONE - 2
Chair: Hans-Joachim Alheid / Patrick Lebon

15 h 00 - 15 h 20  →  Similarities in the Hydro-Mechanical response of Callovo-Oxfordian clay and Boom clay during gallery excavation
O/10A/1
Y. Wileveau¹, F. Bernier²
¹Andra, France / ²ESV EURIDICE GIE, Belgium

15 h 20 - 15 h 40  →  Why are the geometries of the EDZ fracture networks different in the Mont Terri and Meuse/Haute-Marne rock laboratories? Structural approach
O/10A/2
C. Nussbaum¹, Y. Wileveau², P. Bossart³, A. Mõri¹, G. Armand²
¹Geotechnical Institute Ltd., Switzerland / ²Andra, France / ³Swisstopo, Switzerland

15 h 40 - 16 h 00  →  Characterisation of the Excavation-Damaged Zone in the Meuse / Haute-Marne Underground Research Laboratory
O/10A/3
G. Armand, P. Lebon, M. Cruchaudet, H. Rebours, J. Morel, Y. Wileveau
Andra, France

16 h 00 - 16 h 20  →  EDZ characterisation with ultrasonic interval velocity measurements in the Meuse/Haute-Marne URL, performed between depth of 85m and 504m
O/10A/4
K. Schuster, H. - J. Alheid
BGR, Germany

→  Coffee break

→

SESSION 11A  EXCAVATION DAMAGED ZONE - 3
Chair: Till Popp / Jean-Dominique Barnichon

16 h 50 - 17 h 10  →  Clay formation at the Meuse Haute Marne URL: evaluation of the impact of resin filled slots on flow paths characteristics within the EDZ
O/11A/1
J.-M. Lavanchy¹, J. Croisé¹, R. Schwarz¹, G. Armand², M. Cruchaudet²
¹Colenco Power Engineering AG, Switzerland / ²Andra, France

17 h 10 - 17 h 30  →  Characterisation and evolution of EDZ by extraction and analyse of noble gases in pore waters in the Meuse/Haute Marne URL site
O/11A/2
B. Lavielle, B. Thomas, E. Gilabert
University Bordeaux 1-2, France

17 h 30 - 17 h 50  →  In-situ gas test for the characterisation of Excavation Disturbed Zone at the Meuse/Haute Marne URL
O/11A/3
H. Shaq, K. Schuster, J. Sönnke, V. Bräuer
Federal Institute for Geosciences and Natural Resources (BGR), Germany

17 h 50 - 18 h 10  →  Flow and reactive transport model of a ventilation experiment in Opalinus Clay
O/11A/4
L. Zheng¹, J. Samper¹, L. Montenegro¹, J.C. Mayor²
¹University A Coruña, Spain / ²ENRESA, Spain
SESSION 10B  ALKALINE PERTURBATION
Chair: Reiner Doehrmann / Nicolas Michau

15 h 00 - 15 h 20  Effect of deviation from equilibrium on dissolution rate of smectite under hyperalkaline condition
O/10B/1
T. Sato1, Y. Otani1, H. Takayama1, S. Yokoyama2, C. Oda3, A. Honda3, T. Yoneda1
1Graduate School of Engineering, Hokkaido University, Japan /
2Central Research Institute of the Electric Power Industry, Japan /
3Japan Atomic Energy Agency, Japan

15 h 20 - 15 h 40  Influence of high pH fluid circulation on the mechanical behaviour of compacted clayey soil
O/10B/2
O. Cuisinier1, F. Masrouri2, M. Pelletier2, F. Villieras2
1Laboratoire Central des Ponts et Chaussées, France /
2Institut National Polytechnique de Lorraine, France

15 h 40 - 16 h 00  Alteration of montmorillonites in saline solutions
O/10B/3
H.-J. Herbert1, J. Kasbohm2
1Gesellschaft für Anlagen- und Reaktorsicherheit mbH, Germany /
2Ernst-Moritz-Arndt-Universität, Germany

16 h 00 - 16 h 20  Organic matter-metals (Ti, Cr, Fe) interactions at the Khushaym Matruk natural analogue (Central Jordan)
O/10B/4
M. Elie1, I. Techer2, L. Trottignon3, H. Khoury4, E. Salameh4, D. Vandamme2, P. Boulvais5, S. Fourcade5
1G2R, University Nancy, France /
2UMR CNRS 6635-CEREGE, France /
3CEA Cadarache, France /
4Department of Geology, University of Jordan, Jordan /
5UMR CNRS, 6118-Geosciences Rennes, France

→ Coffee break

SESSION 11B  THERMO HYDRO MECHANICAL & CHEMICAL PROCESSES
Chair: Eduardo Alonso / Frédéric Plas

16 h 50 - 17 h 10  Geochemical behaviour of a bentonite barrier: results up to 8 years of Thermo-Hydraulic treatment in the laboratory
O/11B/1
A.M. Fernández, M.V. Villar, R. Gómez-Espinap
CIEMAT – Centro de Investigaciones Energéticas, Spain

17 h 10 - 17 h 30  Coupled THMC model of FEBEX mock-up test
O/11B/2
L. Zheng, J. Samper
University A Coruña, Spain

17 h 30 - 17 h 50  Couplings of THMC phenomena in deep argillaceous rock of a radioactive waste repository
O/11B/3
A. Haxaire, I. Djeran-Maigre
LGCE, INSA de Lyon, France

17 h 50 - 18 h 10  A THMC framework to consider microstructural effects in the analysis of clay barriers
O/11B/4
L. do N. Guimarães1, M. Sánchez2, A.M. Fernández3, A. Gens4
1University Federal Pernambuco, Brazil /
2University Strathclyde, UK /
3CIEMAT, Spain /
4University Politécnica de Catalunya, Spain
THURSDAY SEPTEMBER 20, Morning

Auditorium Pasteur

SESSION 12  HYDRO-MECHANICAL PROCESSES - 3
Chair: Patrik Sellin / Charles Fairhurst

8 h 30 - 8 h 50  ➔  Installation and evaluation of a large-scale in-situ shaft seal experiment in Boom clay – the RESEAL project
O/12/1
M. Van Geet¹, W. Bastiaens¹, G. Volckaert¹, E. Weetjens¹, X. Sillen¹, A. Gens², M.V. Villar³, Ch. Imbert³, M. Filippi³, F. Plas³
¹ SCK-CEN, Belgium / ² UPC, 8034 Barcelona, Spain / ³ CIEMAT, Spain / ⁴ CEA, France / ⁵ ANDRA, France

8 h 50 - 9 h 10  ➔  Hydro-Mechanical response of the Callovo-Oxfordian mudstone around a deep vertical drift
O/12/2
J. Vaunat¹, B. Garitte¹, A. Gens¹, K. Su², G. Armand²
¹ Technical University Catalonia, Spain / ² Andra, France

9 h 10 - 9 h 30  ➔  Sensitivity of total stress to changes in externally applied water pressure in KBS-3 buffer bentonite
O/12/3
J.F. Harrington¹, D.J. Birchall¹, P. Sellin²
¹ British Geological Survey, UK / ² SKB, Sweden

9 h 30 - 9 h 50  ➔  Comparison of the poroelastic behavior of Meuse/Haute Marne and Tournemire argillites: effect of loading and saturation states
O/12/4
E. Bemer¹, A. Noiret¹, F. Homand², A. Rejeb³
¹ IFP, France / ² Institut National Polytechnique de Lorraine, France / ³ IRSN, France

9 h 50 - 10 h 10  ➔  Multiscale modelling of the argillites mechanical behaviour
O/12/5
A. Abou-Chakra Guéry¹,², F. Cormery², K. Su², J.F. Shao², D. Kondo²
¹ Laboratoire de Mécanique of Lille, France / ² Andra, France

➔  Coffee Break
### THURSDAY SEPTEMBER 20, Morning

**Auditorium Pasteur**

### SESSION 13  INTEGRATION / PERFORMANCE ASSESSMENT  
*Chair: Philippe Lalieux / Laurence Johnson*

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>11 h 00</td>
<td>Influence of the transport parameter uncertainty on the long-term</td>
<td>A. Rübel</td>
<td>O/13/1</td>
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<td>safety of nuclear waste repositories in clay formations</td>
<td>GRS, Germany</td>
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<td>11 h 20</td>
<td>Transferability of external information to clay- and shale-hosted sites</td>
<td>M. Mazurek¹, A. Gautschi², P. Marschall², G. Vigneron³, P. Lebon³, J. Delay³</td>
<td>O/13/2</td>
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<td>use for supporting safety cases</td>
<td>Rock-Water Interaction, University of Bern, Switzerland /² Nagra, Switzerland /³ Andra, France</td>
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<tr>
<td>11 h 40</td>
<td>Investigations on safety relevant repository design in German clay formations</td>
<td>M. Jobmann¹, L. Uhlig¹, P. Amelung¹, H. Schmidt¹, M. Polster¹, D. Billaux², P. Hoth³</td>
<td>O/13/3</td>
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<td>DBE Technology, Germany /² ITASCA Consultants, France /³ Federal Institute for Geosciences and Natural Resources, Germany</td>
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### 12 h 00 – 12 h 30  
**CLOSURE CEREMONY**  
*Chair: Patrick Landais*

### 12 h 30 – 14 h 00  
**Lunch (Espace Jeanne de Flandre)**
Poster SESSIONS

SEPTEMBER 17→20, 2007
LILLE
3rd INTERNATIONAL MEETING
Monday 17th to Wednesday 18th - 14:00 - 15:00

SESSION: GENERAL STRATEGY, CLAY BASED DISPOSAL CONCEPTS & INTEGRATION (GSI)

P/GSI/01 - Assessment of backfill materials and methods for deposition tunnels
P. Køto1, D. Gunnarsson2, L.-E. Johannesson3, J. Hansen4
1 Saanio & Riekko Oy Consult. Eng., Finland / 2 SKB, Sweden /
3 Clay Techn., Sweden / 4 POSIVA Oy, Finland

P/GSI/02 - HTV-1: A semi technical scale testing of a multi-layer hydraulic shaft sealing system
K. Emmerich1, G. Kemper1, F. König2, S. Schläger3, M. Gruner4, M. Hofmann5, R. Nüesch1, R. Schuhmann5
1 Univ. Karlsruhe, Germany / 2 Inst. für Meteorologie und Klimaforschung, Karlsruhe, Germany / 3 Schlaeger, Germany / 4 Inst. für Bergbau und Spezialbeton, Freiberg, Germany / 5 Inst. für Technische Chemie, Karlsruhe, Germany

P/GSI/03 - Development of water content adjust method by mixing powdered-ice and chilled-bentonite: application to the construction of bentonite engineered barriers by shotclay method
I. Kobayashi, M. Toida, T. Sasakura
Technical Research Inst., Kajima Corporation, Japan

P/GSI/04 - Repository design issues related to the thermal impact induced by heat emitting radioactive waste
F. Bernier, X.L. Li
ESV EURIDICE GIE, Belgium

P/GSI/05 - Pillared clays, using Roumanian montmorillonite
I. D. Nistor1, N. Doru Miron1, T. Sajin1, A. Azzouz2, I. Simineanu3, E. Panturu4, R. Radulescu4, C. Jinescu4, P. R. Ioan5
1 Bucov Univ., Romania / 2 Quebec Univ. of Montreal, Canada / 3 Technical Univ. of Iasi, Romania / 4 Research & Development National Inst. for Metals and Radioactive Resources, Romania / 5 Univ. Politehnica Romania

P/GSI/06 - Simulation of differential settlements of clay based engineered barrier systems in a geocentrifuge
B. V S Viswanadham, S. Rajesh, S. S. Sengupta
Indian Inst. of Technology Bombay, Mumbai, India

P/GSI/07 - Critical issues regarding clay behaviour in the KBS-3H repository design
J. Autio1, T. Sandén2, L. Börgesson2
1 Saanio & Riekko Oy Consulting Engineers, Finland / 2 Clay Technology AB, Sweden

P/GSI/08 - Alternative buffer material experiment
D. Svensson1, A. Eng2, P. Sellin1
1 SKB, Sweden / 2 Aco

P/GSI/09 - Assessing the performance of a swelling clay tunnel seal and issues identified in the course of its operation
D.A. Dixon1, J.B.Martino1, B.Vignal2, T. Fujita3
1 AECL, Canada / 2 Andra, France / 3 JAEA, Japan

P/GSI/10 - Activation of a Ca-bentonite as buffer material
W.-H. Huang1, W.-C. Chen2, S.-R. Yang1
1 National Central Univ., Taiwan / 2 Atomic Energy Council, Taiwan

P/GSI/11 - Large diameter borehole type repository in the clays for radioactive waste long term storage
S. Dmitriev, L. Prozorov, Yu. Litinsky, A. Tkachenko, A. Guskov
State Unitary Enterprise MasSIA “Radon”

P/GSI/12 - Erosion of backfill materials during the installation phase
T. Sandén, L. Börgesson
Clay Technology AB, Sweden

P/GSI/13 - Behaviour of the clay cover of a site for very low level nuclear waste: field flexion tests
S. Camp1,2, J.P. Gourc1, O. Ple2, J.L. Kaelin3, A. Marchiol4, C. Round3
1 LTH, France / 2 CS-R, France / 3 SCETAURROUTE, France / 4 Andra, France

P/GSI/14 - Laboratory tests made on three different backfill candidates for the Swedish KBS-3V concept
L.-E. Johannesson, U. Nilsson
Clay Technology AB, Sweden

P/GSI/15 - Engineering geological clay research for radioactive waste repository in Slovakia
R. Adamcova1, J. Frankovska2, T. Durmekova1, Z. Haasova1
1 Comenius Univ. Bratislava, Slovakia / 2 State Geological Inst. of Dionyz Stur, Slovakia

P/GSI/16 - ESDRED project, module 1 - Design, fabrication, assembly, handling and packaging of buffer rings
C. Gatafin1, J.-L. Guyot2, S. Resnikow3
1 CEA, France / 2 SEGULA Ingenierie, France / 3 MPC, France

P/GSI/17 - Laboratory experiments on the sealing ability of bentonite pellets
O. Karland1,2, U. Nilsson1, H. Weber3, P. Wersin3
1 Clay Technology AB, Sweden / 2 Lund Univ., Sweden / 3 Nagra, Switzerland

Remark: Full organisations names and authors addresses are available in the book of abstracts.
P/GSI/18 - Screening of bentonite resources for use as an engineered barrier component in deep geologic repositories
M.N. Gray¹, D.A. Dixon²
¹ IAEA, Austria / ² Atomic Energy of Canada Limited, Canada

P/GSI/19 - Assessment of the radionuclide release from the near-field environment of a spent nuclear fuel geological repository
A. Poulesquen, J. Radwan, C. Poinsot, C. Ferry
CEA, France

P/GSI/20 - Emplacement tests with granular bentonite
H.P. Weber¹, M. Plötze²
¹ Nagra, Switzerland / ² Inst. for Geotechnical Engineering, Switzerland

SESSION: ALTERATION PROCESSES (AP)

P/AP/01 - Natural systems evidence for the alteration of clay under alkaline conditions
D. Savage¹, S. Benbow¹, C. Watson¹, H. Takase², C. Oda³, A. Honda³
¹ Quintessa Ltd, UK / ² Quintessa K.K., Japan / ³ JAEA, Japan

P/AP/02 - Stress corrosion cracking of carbon steel exposed to deep geological environment.
A. Didot¹, E. Herms¹, C. Bataillon¹, J. Chêne¹, D. Crusset²
¹ CEA, France / ² Andra, France

P/AP/03 - Microstructure of compacted argillite submitted to an alkaline plume
O. Cuisinier¹, F. Masrouï², M. Pelletier², F. Villeras², R. Mosser–Ruck²
¹ Laboratoire Central des Ponts et Chaussées, France / ² Institut National Polytechnique de Lorraine, France

P/AP/04 - The effect of the high pH alkaline solutions on the mineralogy and leachate chemistry of the Boom clay – batch experiment at 60°C
M. Honty¹, M. Van Geet¹,², M. De Craen¹
¹ SCK-CEN, Belgium / ² ONDRAF-NIRAS, Belgium

P/AP/05 - Effects of grouting and shotcreting on the backfill geochemistry of a KBS-3 HLNW repository
D. Arcos, M. Luna, L. Duro
Environ Spain, S.L., Spain

P/AP/06 - Evaluation of geochemical scenarios for iron/argillite interactions in a deep waste disposal: a densitivety study on reaction rates and gas partial pressures
L. Trotignon, T. Hairapetian, O. Bildstein, M. Jullien
CEA France

P/AP/07 - Smectite interaction with metal iron
M. Osacký¹, V. Šucha¹, J. Madejová², L’ Puškelová², P. Komadel², M. Miglierini³, A. Majerník², P. Uhlik¹
¹ Comenius Univ, Slovakia / ² Slovak Academy of Sciences, Slovakia / ³ Slovak Univ. of Technology, Slovakia

P/AP/08 - Insights into long-term alteration of bentonite–cement system based on coupled mass-transport/chemical reaction analysis
T. Yamaguchi, F. Yamada, K. Negishi, S. Hoshino, M. Mukai, T. Tanaka, S. Nakayama
JAEA, Japan

P/AP/09 - Effects of alkaline alteration on water diffusivity in montmorillonite gels – A NMR study
T. Takahashi¹, T. Ohkubo², Y. Ikeda¹
¹ Tokyo Inst. of Technology, Japan / ² JAEA, Japan

P/AP/10 - Investigation of smectite alteration and form of iron corrosion products in compacted bentonite being in contact with carbon steel for ten years
T. Ishidera¹, K. Ueno¹, S. Kurosawa², T. Suyama²
¹ JAEA, Japan / ² Inspection Development Corporation, Japan

P/AP/11 - TEM characterization of the FEBEX bentonite after two-years contact with iron corrosion products
E. Torres¹, M.J. Turroño¹, P.L. Martín¹, A. Escríbano¹, J.L. Baldonedo²
¹ CIEMAT, Spain / ² Univ. Complutense de Madrid Spain

P/AP/12 - Concrete/FEBEX bentonite interaction: preliminary results on short-term column experiments
M.J. Turroño, A. Escríbano, E. Torres, P.L. Martín
CIEMAT, Spain

P/AP/13 - IPHAP: background information on Philippine bentonites, hyperalkaline waters and potential analogue sites
C.A. Arcilla¹, E. Paguican¹, C. Ferrer¹, W.R. Alexander², J.G. McKinley³
¹ Univ. of the Philippines, Philippines / ² Bedrock Geosciences, Switzerland / ³ McKinley Consulting, Switzerland
P/AP/14 - Simulation of the degradation of a concrete/clay interface: influence of temperature, unsaturated conditions and porosity variations  
A. Burnol¹, F. Dupros², N. Spycher², T. Xu², P. Blanc¹, E.C. Gaucher¹  
¹BRGM, France / ²Lawrence Berkeley National Laboratory, USA

P/AP/15 - Integrated study of 6 years in-situ steels/argillite interactions at Tournemire by mineralogical and modelling approaches  
A. Gaudin¹, S. Gaboreau², E. Tineau¹, D. Bartier², S. Petit², D. Beaufort²  
¹Univ. Nantes, France / ²Hyd’ASA, France / ³IRSN, France / ⁴Muséum National d’Histoire Naturelle, France

P/AP/16 - Study of nuclear glass / canister corrosion products / clay system by means of integral modular material tests  
V. Minet¹, J.E. Lartigue¹, K. Lemmens²  
¹CEA France / ²SCK.CEN, Belgium

P/AP/17 - Influence of dissolution/precipitation kinetics on the porosity clogging effect during cement/clay interactions  
N. Marty¹, C. Tournassat¹, E.C. Gaucher¹, A. Burnol¹, E. Giffaut²  
¹BRGM, France / ²Andra, France

P/AP/18 - Alkaline perturbation into the Tournemire argillite: Structural and mineralogical studies of a 15 years in-situ propagation  
E. Tineau¹, J. Cabrerá¹, D. Bartier², I. Techer³, S. Lemius¹  
¹IRSN, France / ²Museum National d’Histoire Naturelle, France / ³GIS/CEREGE, Univ. d’Aix-Marseille, France

P/AP/19 - Geochemical behavior of clay material under neutral and alkaline conditions at low temperature  
B. Made³, L. Michaux²  
¹Ecole des Mines de Paris, France / ²CEA, France

P/AP/20 - A migration technique applied to study alteration of compacted sand-bentonite mixture in contact with concrete  
T. Sugiyama¹, Y. Tsuji²  
¹Hokkaido Univ., Graduate School of Engineering, Japan / ²Gunma Univ., Japan

P/AP/21 - Hydrothermal alteration of Callovo-Oxfordian argillite from the Paris basin by neutral and alkaline solutions at 150°C and 300°C and in the presence of iron metal  
R. Mosser-Ruck, L. Richard, M. Cathelineau  
G2R, Univ. Nancy, CNRS, France

P/AP/22 - Some thermodynamic considerations on the behavior of Kerogen under conditions of alkaline perturbation  
L. Richard  
G2R, Univ. Nancy, CNRS, France

SESSION: GEOCHEMISTRY & MINERALOGY (GM)

P/GM/01 - Influence of natural sorbents immobilization of spent ion exchange resins in cement  
I. Plecas, S. Dimovic  
Vinca Inst. of Nuclear Sciences, Serbia

P/GM/02 - Chemical stability of rare-earth silicate  
Univ. Sevilla, Spain

P/GM/03 - Mineralogical heterogeneity of Rokle bentonite and radionuclide adsorption: A case study for cesium  
J. Vejsada, A. Vokál  
Nuclear Research Inst., Czech Republic

P/GM/04 - Rheological and sorption properties of clay-polymer composites  
H.P. Zadvernyuk, Y.G. Fedorenko, B.P. Zlobenko, T.I. Koromyslichenko  
National Academy of Science of Ukraine, Ukraine

P/GM/05 - Clay mineral interactions with leachate solutions in landfills  
S. Battaglia, M. Cervelli  
Italian National Research Council, Italy

P/GM/06 - Lithium isotope fractionation during adsorption onto mineral surfaces  
R. Millet, J.P. Girard  
BRGM, France

P/GM/07 - Sorption of Sr²⁺ onto mixed smectite / illite clays  
Tiziana Missana, Miguel García-Gutiérrez, Úrsula Alonso  
CIEMAT, Departamento de Medioambiente, Spain

P/GM/08 - Eh and pH in the porewater of compacted bentonite  
A. Muurinen, T. Carlsson  
VTT Technical Research Centre of Finland, Finland
Monday 17th to Wednesday 18th - 14:00 - 15:00

P/GM/09 - Chemical interaction of $^{152}$Eu with the clay barrier
Univ. Sevilla, Spain

P/GM/10 - Modeling the acid-base surface chemistry of Montmorillonite
I.C. Bourg$^{1,2,3,4}$, G. Sposito$^{2,4}$, A.C.M. Bourg$^{3}$
$^1$Andra, France / $^2$Univ. of California, USA / $^3$Univ. Pau et Pays de l’Adour, France / $^4$Lawrence Berkeley National Laboratory, USA

P/GM/11 - A time resolved laser fluorescence and X-ray absorption spectroscopy of lanthanide/actinide sorption on clay minerals: influence of carbonate complexation
M. Marques Fernandez$^1$, Th. Rabung$^2$, R. Dahn$^1$, B. Baeyens$^1$, M. H. Bradbury$^1$
$^1$Paul Scherrer Institut, Switzerland / $^2$FZK-INE, Germany

P/GM/12 - Structure elucidation and occurrence of Tc(IV) pyrogallol complexes
E. Breynaert, A. Maes
Katholieke Univ. Leuven, Belgium

P/GM/13 - Geochemistry of Se(0) under boom clay conditions
C. Bruggeman, A. Maes, J. Vancluysen
Katholieke Univ. Leuven, Belgium

P/GM/14 - Experimental and modelling study of pure secondary silicate minerals reactivity in geological CO$_2$ sequestration conditions
A. Credoz$^1$, O. Bildstein$^1$, M. Jullien$^1$, J. Raynal$^1$, J.-C. Pétrocin$^1$, L. Trotignon$^1$, O. Pokrovsky$^2$
$^1$CEA, France / $^2$LMTC, UPS, IRD, Observatoire Midi-Pyrénées, France

P/GM/15 - Experimental evaluation of a retention model for major groundwater elements on the Tournemire argillite
P. Jaccquier$^1$, C. Beaucarne$^1$, A.L. Vuillaume$^2$, Ch. Wittebroodt$^1$, J. Ly$^1$, J. Page$^1$, S. Savoye$^2$, H. Pitsch$^2$
$^1$CEA, France / $^2$IRSN, France

P/GM/16 - Modelling the long term intake of cementitious pore water with Boom clay
D. Jacques, L. Wang
SCK-CEN, Boeletang 200, Belgium

P/GM/17 - Sorption-desorption of radionuclides and analogues in clays suitable for barriers
E. Galuin$^1$, P. Chain$^2$, M.D. Alba$^2$, M. Vidal$^1$
$^1$Univ. Barcelone, Spain / $^2$Univ. Sevilla, Spain

P/GM/18 - Modelling of the Redox evolution in the tunnel backfill of a high level nuclear waste repository
F. Grandia, C. Domènech, D. Arcos, L. Duro, J. Bruno
Enviros Spain, S.L., Spain

P/GM/19 - Reactivity of nitrates in the different storage compartments of type-b wastes
L. André$^1$, H. Pauwels$^1$, M. Azaroual$^1$, A. Albrecht$^2$, M.-A. Romero$^2$
$^1$BRGM, France / $^2$Andra, France

P/GM/20 - Investigation into the biodiversity of sulphate reducing bacteria in Boom clay
S. Aerts$^1$, P. Boven$^1$, M. Van Geet$^{1,2}$, P. De Boever$^3$
$^1$SCK-CEN, Belgium / $^2$ONDRAF/NIRAS, Belgium / $^3$Environmental Toxicology, Belgium

P/GM/21 - Colloid generation mechanisms from compacted bentonite under different geochemical conditions
U. Alonso, N. Albarran, T. Missana, M. Garcia-Gutiérrez
CIEMAT, Spain

P/GM/22 - Experimental reduction of aqueous sulphate by hydrogen in the context of the Callovo-Oxfordian argillite
L. Truche$^1$, G. Berger$^1$, D. Guillaume$^1$, E. Jacquot$^2$
$^1$Univ. de Toulouse, CNRS, IRD, OMP, France / $^2$Andra, France

P/GM/23 - Cation exchanged Fe(II) and Sr as compared to other divalent cations (Ca, Mg) in the Callovo-Oxfordian formation. Implications for porewater composition modeling
C. Tournassat$^1$, C. Lerouge$^1$, J. Brenndlé$^2$, J.-M. Greneche$^3$, S. Touzelet$^1$, P. Blanc$^3$, E.C. Gaucher$^1$
$^1$BRGM, France / $^2$LMPC, France / $^3$LPEC, France

P/GM/24 - Monte Carlo sensitivity analysis of modelled Opalinus clay porewaters from the Mont Terri rock laboratory
T. Thoenen
Waste Management Laboratory, Paul Scherrer Institut, Switzerland

P/GM/25 - Microstructural investigation of Opalinus clay – proposal of a carbonate distribution model
M. Klinkenberg$^{1,2}$, S. Kaufhold$^1$, R. Dohrmann$^1$, S. Siegesmund$^2$
$^1$BGR, Germany / $^2$Geowissenschaftliches Zentrum der Universität Göttingen, Germany
P/GM/26 - Influence of natural organic matter on the sorption behaviour of Eu on illite (as model component for Boom clay)
D.J. Liu, C. Bruggeman, N. Maes
SCK-CEN, Belgium

P/GM/27 - Fate of boron and dynamics of reactive transport processes in the near field of a HLW disposal
CEA, France

P/GM/28 - Sulfate-reducing bacteria (Desulfovibrio desulfuricans) activity monitored by magnetic measurements in Bure claystones (France) and Mont Terri claystones (Switzerland)
C. Aubourg1, D. Janots2, J.-P. Pozzi2
1 CNRS & Univ. Cergy Pontoise, France / 2 CNEA & ENS Paris, France

P/GM/29 - Influence of EDTA and isosaccharinate organic ligands on the uptake and migration of europium in the Callovo-Oxfordian argillite
J. Klein, J. Pointeau
CEA, France

P/GM/30 - Experimental determination of thermodynamic properties of a chloride
H. Gailhanou1, J. Rogez2, J.C. van Miltenburg3, A. van Genderen3, J.M. Grenèche4, E.C. Gaucher1, C. Crouzet1, S. Touzelet1, P. Blanc1
1 BRGM, France / 2 Univ. Paul Cézanne, France / 3 Utrecht Univ., The Netherlands / 4 Univ. de Maine, France

P/GM/31 - Structural incorporation of trivalent f elements into the trictahedral clay mineral hectorite
N. Finck1, K. Dardenne1, M. L. Schlegel2, D. Bosbach1
1 FZK-INE, Germany / 2 CEA, France

P/GM/32 - Heavy metals migration in argilaceous rocks: on the use of laser-induced breakdown spectroscopy microprobe (Libs microprobe) as a microanalysis tool
D. Menu, J.L. Lacour, L. Salmon
CEA, France

P/GM/33 - Isotopic anomalies observed at the vicinity of fractures in porewater of Tournemire shales: experimental artefacts or local palaeocirculations?
S. Savoye1, J.L. Michelot2, M.V. Altinier1,2, S. Lemius1
1 IRSN, France / 2 Univ. Paris-Sud, France

P/GM/34 - Effect of temperature on the retention capacity of compacted bentonite: an experimental and numerical investigation
A. Jacinto1, R. Gómez-Espina2, M.V. Villar2, A. Ledesma1
1 Tech. Univ. of Catalunya, Spain / 2 CIEMAT, Spain

P/GM/35 - Retention of Cs in Boom Clay: comparison of data from batch sorption tests and diffusion experiments on clay cores
N. Maes1, S. Salah1, D. Jacques1, M. Aertsens1, M. Van Gompel1, P. De Cannière1, N. Velitchkova2
1 SCK-CEN, Belgium / 2 Bulgarian Academy of Science, Bulgaria

P/GM/36 - Sorption and engineering characteristics of some clay/shale deposits from Nigeria as landfill liner
M.N. Tijani, O.P. Bolaji
Dept. of Geology, Univ. of Ibadan, Nigeria

P/GM/37 - Influence of organic matter composition on iodine sorption: from fresh to thermally matured peat
S. Maillan1,2, P. Faure1, E. Leclerc2
1 G2R, Univ. Nancy, France / 2 Andra, France

P/GM/38 - Observation of microstructure of compacted Bentonite by X-ray micro CT method optimized with computer simulation
H. Takamatsu, N. Noda, T. Kozaki, M. Kitaichi, S. Tomioka, S. Sato
Hokkaido Univ., Japan

P/GM/39 - Hydration and hydrolysis of Sm3+ and Eu3+ in clay interlayer: neutron diffraction study
O. Sobolev1, L. Charlet1, G.J. Cuello2, A. Gehin1, J. Brendle3
1 Univ. Grenoble 1, CNRS, France / 2 Institut L. Langevin, France / 3 LMPC, France

P/GM/40 - Molecular simulations of Na+ and Ca2+ Montmorillonite
M. Hedström, M. Birgersson, O. Karna
Clay Technology AB, Sweden

P/GM/41 - Effect of temperature on the proton charge of Montmorillonite
M. Duc, F. Thomas, F. Gaboriaud
Univ. Nancy, CNRS, France

P/GM/42 - Transformation of organic matter in the presence of smectite: fate of lanthanides during polymerization reactions
T. Schäfer1, P. Michel1, F. Claret2, G. Buckau1, M. Elie3
1 FZK-INE, Germany / 2 CEA, France / 3 CREGU, France
P/GM/43 - Surface complexation modelling using multi-components approach. Sorption of selenium on argilite
N. Marmier, C. Hurel
Univ. Nice Sophia Antipolis, France

P/GM/44 - In-situ characterization of the Callovian-Oxfordian porewater composition
A. Vinsot1, S. Mettler2
1 Andra, France / 2 gas Nagra, Switzerland

P/GM/45 - Natural organic matter fractionation on mineral surfaces: a spectroscopic approach
F. Claret1,2, T. Schäfer3, P. Reiller1
1 CEA, France / 2 BRGM, France / 3 FZK-INE, Germany

P/GM/46 - Examination of clay minerals-organic matter interactions at submicron-scale during confined pyrolysis of a simplified system Volclay-bentonite -type II kerogen
P. Michel1, Th. Schäfer1, F. Clarét2, M. Elie3
1 FZK-INE, Germany / 2 CEA, France / 3 Univ. Nancy, CNRS, France

P/GM/47 - Sorption of Np(v), U(vi) and Cs onto bentonite and clayey soils
M.N. Sabodina1,2, St. N. Kalmykov2, K.A. Artem’eva2, E.V. Zakharova1
1 Russian Academy of Science, Russia / 2 Lomonosov Moscow State Univ., Russia

P/GM/48 - The PHREEQC / traces coupling tool within the ALLIANCES platform
A. Dimier1, J. Gaonbalet2, N. Letterrier2
1 Andra, France / 2 CEA, France

P/GM/49 - Is pore water close to the surfaces of a clay rock enriched in heavy water isotopes as compared to free pore water?
Th. Gimmi1,2, H.N. Weber1
1 Univ. of Bern, Switzerland / 2 Paul Scherrer Institut, Switzerland

P/GM/50 - Ageing effect on the chemical and isotopic (Sr and Ar) characteristics of cored Mont Terri Opalinus Clays
I. Techer1, N. Clauer2, N. Liewig3
1 CEREGE, France / 2 CNRS, Univ. L. Pasteur Strasbourg, France / 3 Inst. Pluisc. H. Cuen, CNRS, France

P/GM/51 - Effect of concentration of the couples of Cation (Cu2+, Pb2+) on the natural selectivity phenomena in the case of Na-Montmorillonite: qualitative XRD analysis
W. Oueslati1, M. S. Karmous1, H. Ben Rhaïem1, B. Lanson2, A. Ben Haj Amara1
1 Faculté des Sciences de Bizerte, Tunisia / 2 Univ. J. Fourier Grenoble, France

P/GM/52 - Qualitative study of synthetic Na-Hectorite saturated by heavy metals cations
M.S. Karmous1, W. Oueslati1, M. Meftah1, H. Ben Rhaïem1, J. L. Robert2, A. Ben Haj Amara1
1 Faculté des Sciences Bizerte, Tunisia / 2 IMPMC, France

SESSION: INVESTIGATION ON GEOLOGICAL ENVIRONMENTS (IGE)

P/IGE/01 - (S, O, Sr) isotopic constraints on the diagenetic evolution of the Callovian-Oxfordian formation at the Meuse/Haute-Marne URL
C. Lerouge1, D. Widory1, C. Guerrot1, E.C. Gaucher1, S. Buschaert2
1 BRGM, France / 2 Andra, France

P/IGE/02 - Scale effect and heterogeneity of hydraulic conductivity of sedimentary rocks at Horonobe URL site
H. Urikami1, R. Takeuchi1, S. Yabuuchi2
1 JAEA Japan / 2 Ministry of Economy, Trade and Industry, Japan

P/IGE/03 - Investigation and modeling of 3D distribution of water chemicals in Horonobe, Hokkaido, Japan
T. Kunimaru1, H. Yamamoto2
1 J&A, Japan / 2 Technology Center, Toisei Corporation, Japan

P/IGE/04 - PH4: a 250 m deep borehole in Tounemire for assessing the contribution of transport phenomena to assumed overpressures in the Toarcian/Domerian semipermeable
J.M. Matray1, J. Gonçalves2, S. Savoye1, I. Girardin2, J. Cabrera1, P. Lecathelinais1
1 IRSN, France / 2 Univ. Pierre et Marie Curie, France

P/IGE/05 - Lateral variability of mineralogy and pore water chemistry of the Boom Clay
M. De Craen1, M. Honty1, I. Wernaere1, M. Van Geet1,2
1 SCK-CEN, Belgium / 2 ONDRAF-NIRAS, Belgium

P/IGE/06 - 36Cl in groundwaters of Oxfordian and Dogger limestones of the Eastern Paris basin: implications for old groundwater dating
C. Le Gal La Salle1, L. Benedetti2, J. Lancelot1, D. Bourlès2, B. Hamelin2
1 GIS, Univ. de Nîmes, France / 2 CEREGE, Univ. Aix-Marseille 3, France
SESSION: MASS TRANSFER & POROUS MEDIA (MTPM)

P/IGE/07 - Statistical preprocessing and analyses of hydrogeo-meteorologic time series in the PP experiment of Mont Terri (method. & first results)
H. Fatmi1, R. Ababou1, J.M. Matray2
1 Institut de Mécanique des Fluides de Toulouse, France / 2 IRSN, France

P/IGE/08 - Hydraulic conductivity of the Boom Clay in north-east Belgium based on four core-drilled boreholes
I. Wemaere, J. Marivoet, S. Labat
SCK-CEN, Belgium

P/IGE/09 - A new approach of laboratory permeability measurement of very tight rocks: experimental data of BCF, Mecsek MtS, SW Hungary
F. Fedor, Z. Máthé, G. Hámos, G. Somodi
MECEKÉRC Ltd, Hungary

P/MTPM/01 - Interlayer / micropore exchange of water and ions in clays: a molecular dynamics study
B. Rotenberg1, V. Marry1, N. Malikova2, R. Vuilleumier1, E. Giffaut1, P. Turq1
1 Univ. Paris 6, France / 2 CEA, France / 3 Andra, France

P/MTPM/02 - Multi-scale characterisation of mineral and textural spatial heterogeneities in Callovo-Oxfordian argillite and its consequence on solute species diffusion modelling
J.-C. Robinet1, N. Dia2, P. Sardini1, F. Goutelard2, D. Menut2, J.-C. Parneix3, S. Sammartino4, D. Prêt1, D. Coelho3
1 HydRA, France / 2 CEA, France / 3 ERM, France / 4 UMR INRA CSE, France / 5 Andra, France

P/MTPM/03 - Diffusion of ions in unsaturated clay-rocks: Theory and application to the Callovo-Oxfordian argillite
D. Jougnot1, 2, A. Revil1, 3
1 CNRS-CEREGE, France / 2 Andra, France / 3 Colorado School of Mines, USA

P/MTPM/04 - Porous media characterization with respect to gas transfer in Callovo Oxfordian argillite
P.F. Boulin1, R. Angulo-Jaramillo2, J.F. Daian3, J. Talandier4, P. Berne1
1 CEA, France / 2 ENTPE, France / 3 LTHE, France / 4 Andra, France

P/MTPM/05 - Predictions on a 2-D cementation experiment in porous medium: intercomparision on the comedie projet
B. Cochevin1, L. Troitignon1, O. Bildstein1, C. Steefel2, V. Lagneau3, J. van der Lee3
1 CEA, France / 2 Lawrence Berkeley National Laboratory, USA / 3 Ecole des mines de Paris, France

P/MTPM/06 - Large-scale gas injection test (LASGIT) at the Äspö hard rock laboratory in Sweden
D.J. Birchall1, J.F. Harrington1, D.J. Noy1, P. Sellin2
1 British Geological Survey, UK / 2 SKB, Sweden

P/MTPM/07 - Simulating the geochemical coupling between vitrified waste, canister and near-field on the alliances platform
O. Bildstein, E. Piault, L. Trottignon, P. Montarnal, E. Deville
CEA, France

P/MTPM/08 - Toward radionuclide transport calculations on whole radioactive waste disposal with CAST3M platform
A. Genty, C. Le Potier
CEA, France

P/MTPM/09 - Experimental study of the water permeability of a partially saturated argillite
C. Imbert1, P. Semete2, P. Desgreet2, B. Février2, A. Courtois2, G. Touzé1
1 CEA, France / 2 EDF, France

P/MTPM/10 - Mixed hexahedral finite elements for Darcy flow calculation in clay porous media
A. Sboui1, J. E. Roberts2, J. Jafrè3
1 Andra, France / 2, 3 INRIA, France

P/MTPM/11 - Diffusive properties of stainless steel filter discs before and after use in diffusion experiments with compacted clays
M.A. Glaus, R. Rossé, L.R. Van Loon
Laboratory for Waste Management, Paul Scherrer Institut, Switzerland

P/MTPM/12 - Structural organization of porosity in the Opalinus clay at the Mont Terri Rock Laboratory under saturated and unsaturated conditions
J.M. Matray1, J.C. Parneix2, E. Tinseau1, D. Prêt3, J.C. Mayor4
1 IRSN, France / 2 ERM, France / 3 HYDRASA, France / 4 ENRESA, Spain

P/MTPM/13 - Evaluation of pore structure in compacted saturated Bentonite using NMR relaxometry
T. Ohkubo1, H. Kikuchi1, M. Yamaguchi2
1 JAEA, Japan / 2 Inst. of Research and Innovation, Japan

P/MTPM/14 - Diffusion coefficients measurement in consolidated clays: a combination of micro-scale profiling and solid pore structure analyses
U. Alonsa1, T. Missana1, M. Garcia-Gutiérrez1, A. Patelli2, M. Siitari-Kauppi3, A. Leskenin1, V. Rigato4
1 CEMAT, Spain / 2 CIVEN, Italy / 3 Univ. of Helsinki, Finland / 4 LNL-INFN, Italy
P/MTPM/15 - Numerical interpretation of in-situ DIR diffusion experiments on the Callovian-Oxfordian clay at the Meuse/Haute-Marne URL  
J. Samper1, S. Dewonck2, L. Zheng1, Q. Yang1, A. Naves1  
1 Univ. La Coruña, Spain / 2 Andra, France

P/MTPM/16 - Identification of relative conductivity models for water flow and solute transport in unsaturated compacted Bentonite  
Z. Dai1, J. Samper2, A. Wolfsberg1, D. Levitt1  
1 Los Alamos National Laboratory, USA / 2 Univ. La Coruña, Spain

P/MTPM/17 - Diffusion experiments in Callovian-Oxfordian clay from the Meuse/Haute-Marne URL, France: experimental setup and data analyses  
M. García-Gutiérrez1, J.L. Cormenzana2, T. Missana1, M. Mingarro1, U. Alonso1, J. Samper3, Q. Yang3  
1 CIEMAT, Spain / 2 Empresarios Agrupados, Spain / 3 UDC-ETSECCP, Spain

P/MTPM/18 - Transport in organo-montmorillonites: in-situ diffusion experiments using ATR-FITR spectroscopy  
B. Schampera, S. Dultz, B. Riebe  
Leibniz Univ. Hannover, Germany

P/MTPM/19 - Unsaturated flow around high-level long-lived radioactive waste repository drift seal with Alliances platform  
A. Genty1, D. Perraud2  
1 CEA, France / 2 Andra, France

P/MTPM/20 - Numerical Interpretation of gas transport experiments on water-saturated samples of Opalinus clay  
A. Poller1, G. Mayer1, J. Croisé1, P. Marschall2, B. Krooss3, J.M. Matray1, T. Tanaka3, P. Vogel6  
1 Colenco Power Engineering AG, Switzerland / 2 Nagra, Switzerland / 3 Aachen Univ., Germany / 4 IRSN, France / 5 Obayashi Corporation, Japan / 6 BGR, Germany

P/MTPM/21 - Callovian-Oxfordian Formation at the Meuse/Haute-Marne URL: consistency between measured hydraulic conductivity and the drainage effect of the experimental drifts  
J. Croisé5, J. M. Lavanchy1, C.P. Ennsle1, M. Cruchedaud2  
1 Colenco Power Engineering AG, Switzerland / 2 Andra, France

P/MTPM/22 - In-situ diffusion tests performed in the Callovian-Oxfordian mudstone in the Meuse/Haute-Marne URL: Experimental data and numerical interpretations  
S. Dewonck1, M. Descostes2, V. Blin2, J. Radwan2, C. Poinssot2  
1 Andra, France / 2 CEA, France

P/MTPM/23 - Influence of humic colloids on the migration of U(vi) in compacted clay  
J. Milbus1, 2, S. Sachs1  
1 Inst. of Radiochemistry, Germany / 2 Paul Scherrer Institut, Switzerland

P/MTPM/24 - Diffusion of tritiated water and ions through the Tournemire argillite (France) in presence of alkaline fluids  
J. Devol-Brown1, S. Motellier2, E. Tinseau1, D. Thoby2  
1 IRSN, France / 2 CEA, France

P/MTPM/25 - Reactive transport modelling of in-situ cement/clay interactions on Tournemire argillite  
P. Marsal1, L. De Windt2, E. Tinseau3, D. Pellegrini1  
1 IRSN, France / 2 Ecole des Mines de Paris, France / 3 IRSN, France

P/MTPM/26 - Results on Pu diffusion experiments in the Opalinus Clay  
A. Bauer, B. Fieh, Ch. Marquardt, J. Römer, A. Görtzen, B. Kienzler  
FZK-INE, Germany

P/MTPM/27 - Diffusion of H2O and electro-osmosis in water-saturated compacted Na-montmorillonite using H218O as a tracer  
S. Tanaka1, T. Higashihara2, N. Noda1, S. Sato1, T. Kozaki1, H. Sato1, K. Hatanaka1  
1 Hokkaido Univ., Japan / 2 Central Research Inst. of Electric Power Industry, Japan / 3 JAERI, Japan

P/MTPM/28 - Deterministic and probabilistic compact-mental modelling of nitrate reduction and transfer in a bituminous waste cell and the adjacent host rock  
A. Albrect1, MA. Romero1, M. Azaroua2, H. Pauwels2, L. André2  
1 Andra, France / 2 BRGM, France

P/MTPM/29 - Experimental study on gas permeability of the Callovian-Oxfordian argillite of Meuse/Haute-Marne URL  
J. Billiotte1, D. Yang1, K. Su2  
1 Univ. Marne-la-Vallée, France / 2 Andra, France

P/MTPM/30 - Gas intrusion in saturated bentonite – a thermodynamic approach  
M. Birgersson, M. Åkesson, H. Hökmark  
Clay Technology AB, Ideaon Research Centre Lund, Sweden

P/MTPM/31 - Evaluating the application of Archie’s law for argillaceous rocks  
P. Blum1, M. Scheunemann1, L. Van Loon2, D. Coelho3, N. Maes4, P. Grathwohl1  
1 Univ. of Tübingen, Germany / 2 Paul Scherrer Institut, Switzerland / 3 Andra, France / 4 SECK-CEN, Belgium
P/MTPM/32 - Comparison between radial diffusion and leaching for determining chloride and sulphate in Tourménire argillite pore water
Ch. Wittenbrood¹,², S. Savoye¹, P. Jacquier³, C. Beaucaire³, F. Bensenouci¹,⁴, H. Pitsch³, P. Gouze⁴, J.-L. Michelot⁴
¹IRSN, France / ²Univ. Montpellier 2, CNRS, France / ³CEA, France / ⁴Univ. Paris-Sud, France

P/MTPM/33 - A cross method of a nanoscale model and macroscopic data to estimate anion effective diffusion coefficient in argillite
N. Diaz¹, F. Goutelard¹, P. Turq²
¹CEA, France / ²Univ. Paris 6, France

P/MTPM/34 - Numerical modelling of coupled mechanics and gas transfer
P. Gerard¹, R. Charlier¹, J.-D. Barnichon², J.-F. Shao³, G. Duveaux³, D. Hoeha³, C. Chavant⁴, F. Collin⁵
¹Univ. Liège, Belgium / ²Andra, France / ³Univ. Lille, France / ⁴INPL, France / ⁵EDF, France

P/MTPM/35 - Vertical distribution of HCO₃⁻ transport parameters in Boom clay in the Mol-1 borehole (Mol, Belgium)
M. Aertsens¹, M. Van Gompel¹, P. De Cannière¹, N. Maes¹, A. Dierckx²
¹SK-GEN, Belgium / ²ONDRAF-NIRAS, Belgium

P/MTPM/36 - Diffusion experiments in Callovian-Oxfordian clay from the Meuse/Haute-Marne URL France: 2 model results
J. Samper¹, Q. Yang¹, M. García-Gutiérrez², T. Missana², M. Mingarro², U. Alonso², J.-L. Cormenzana³
¹UDC-ETSIECP, Spain / ²CIEMAT, Spain / ³Empresarios Agrupados, Spain

P/MTPM/37 - An experimental protocol for the investigation of diffusion of ions through argillaceous barriers
M.A.M. Kedziorek, A.C.M. Bourg
Univ. Pau et Pays de l'Adour, France

P/MTPM/38 - Gaz permeability of an argilite: measurements and parameters identification
L. Malinsky, H. Garibi, P. Vali
École Polytechnique, France

P/MTPM/39 - CORE²D V4: A general purpose code for groundwater flow, heat and solute transport, chemical reactions and biological processes in porous and fractured media
C. Yang¹, J. Samper¹
¹Univ. La Coruña, Spain / ²Indiana Univ. Bloomington, USA

P/MTPM/40 - Hyperfiltration of metal solutions through low-permeability media and its effects on hydraulic conductivity
G. Houben, F. Wagner
BGR, Germany

P/MTPM/41 - Argillites thermal conductivity variations induced by sedimentary/diagenetic processes and by mechanical decomposition
Y. Géraud¹, L. Esteban¹,², J.L. Bouchez², A. Trouiller³
¹Univ. L. Pasteur, GdR FORPRO, France / ²Univ. Toulouse, GdR FORPRO / ³Andra, France

P/MTPM/42 - Porosity network geometry and inferred permeability of the Callovian-Oxfordian argillites from magnetic fabric and oriented mercury injections
Y. Géraud¹, L. Esteban¹,², J.-L. Bouchez², A. Trouiller³
¹Univ. L. Pasteur, GdR FORPRO, France / ²Univ. Toulouse, GdR FORPRO / ³Andra, France

P/MTPM/43 - Identification and quantification of large-scale diffusion in a deep claystone formation (Opalinus Clay of Mont Russelin, Switzerland)
M. Koroleva¹, M. Mazurek¹, A.M. Fernández², A. Gauthci³, H.N. Weber¹
¹Univ. of Bern, Switzerland / ²CIEMAT, Spain / ³Nagra, Switzerland

P/MTPM/44 - Reactive diffusion front driven by an alkaline plume in compacted Mg-homoionic bentonite
Univ. Autónoma de Madrid, Spain

P/MTPM/45 - Transport number of sodium ions in water-saturated, compacted Na-Montmorillonite
H. Higashi, K. Kinoshita, Y. Akagi, S. Sato, T. Kozaki
Hokkaido Univ., Japan

P/MTPM/46 - Swelling, transport and gas threshold pressure of a sealing bentonite plug: effect of sand addition
F. Skoczylas¹, C.A. Davy¹, P. Lebon², J.-D. Barnichon²
¹Ecole Centrale de Lille, France / ²Univ. Paris-Sud, France

P/MTPM/47 - Species-specific transport and reactive transport modelling of a long-term core infiltration experiment on Opalinus clay
U. Mader¹, Th. Gimmi¹,²
¹Univ. of Bern, Switzerland / ²Laboratory for Waste Management, Switzerland

P/MTPM/48 - Modelling gas injection tests in deformable clay buffers
S. Olivella, E.E. Alonso, D. Arnedo
Univ. Politécnica de Catalunya, Spain
P/EDZ/01 - Influence of bedding planes to EDZ-evolution and the coupled HM properties of Opalinus Clay
T. Poppp, K. Salzer, W. Minkley
Institut für Gebirgsmchank GmbH, Germany

P/EDZ/02 - Electrical tomography monitoring of the EDZ during the excavation of the gallery 04 in the Mont Terri rock laboratory
D. Gibert1, F. Nicollin1, B. Kergosien1, P. Bossart2, C. Nussbaum3
1 CdR FORPRO: Géosciences Rennes, France / 2 Federal Office for Topography, Switzerland / 3 Institut Géotechnique SA, Switzerland

P/EDZ/03 - Seismic endoscopy and tomography of the EDZ of the gallery 04 in the Mont Terri rock laboratory
F. Nicollin1, D. Gibert1, B. Kergosien1, C. Nussbaum2, P. Bossart3
1 CdR FORPRO: Géosciences Rennes, France / 2 Federal Office for Topography, Switzerland / 3 Institut Géotechnique SA, Switzerland

P/EDZ/04 - A elastoplastic damage model for saturated and unsaturated stiffness clays: description and application to the modelling of EDZ around drifts in Callovo-Oxfordian argillites
J.C. Robinet1, M.T Nguyen1, J.D Barnichon2, F. Plas2
ECC Geo-Geomat-Consulting, France / 2 Andra, France

P/EDZ/05 - Noninvasive monitoring of water content and microcracks in argillites using spectral induced polarization
A. Ghorbani1, P. Cosenza1, A. Revil2, D. Jougnot2, M. Schmutz3, N. Flersch1
1 CNRS, Univ. P.M. Cune, France / 2 CNRS, CEREGE, Univ. Aux-Marseille France / 3 Univ. M. de Montaign, France

P/EDZ/06 - EDZ investigations by ultrasonic borehole logging in drifts of different ages excavated in argillaceous formations of the Tournemire experimental station (Aveyron, France)
J. Contrucci1, J. Cabrera2, E. Kle1n, K. Ben-Slimane2
1 INERIS & École des Mines de Nancy, France / 2 IRSN, France

P/EDZ/07 - Excavation damaged zones in the argillaceous Tournemire site: characterisation and failure mechanisms
A. Reeb1, K. Ben Slimane, J.M. Cabrera, J.M. Matray, S. Savoye
IRSN, France

P/EDZ/08 - Hardening based degradation factor: influence of mean stress and stiffness
S. Maiolino1,2
1 LMS, École Polytechnique, France / 2 CETE, LRPC Lyon, Méca Roches, ERA, France

P/EDZ/09 - Disturbance in the EDZ in the Opalinus clay at Mont Terri
S. Yong1, S. Loew1, C. Fidelibus1, F. Lermy1, E. Frank2
1 Engineering Geology, Zurich, Switzerland / 2 Swiss Federal Nuclear Safety Inspectorate, Switzerland

P/EDZ/10 - Experimental study on self-sealing capacity of clay rocks
Chun-Liang Zhang, Tilmann Rothfuchs
GRS, Germany

P/THME/01 - Determining water permeability of a compacted bentonite sand mixture under confined and free-swel conditions
Ecole Nationale des Ponts et Chaussées, France

P/THME/02 - Model prediction of engineered barrier system effectivity in the fracture at laboratory scale
M. Polak3 et al.1,2,4

P/THME/03 - Changes in the hydraulic properties of a smectite in presence of chromium
H. Souli, J.M. Fleureau
Ecole Centrale Paris, France

P/THME/04 - Wall friction and ejection behaviour of bentonite-base buffer material
P. L. Wu1, Y. M. Tien2
1 Atomic Energy Council, TAIWAN / 2 National Central Univ., Taiwan

P/THME/05 - Thermo-hydro-mechanical behaviour of a large scale mock-up test “Ophelie” in Belgium - laboratory characterization and numerical modelling
E. Romero1, X. Li Xiang2
1 Univ. Politécnica de Catalunya, Spain / 2 EIG, EURIDICE, Belgium
P/THME/06 - Modeling swelling characteristics and permeability of several compacted bentonite affected by saline water
Y. Tanaka, T. Hasegawa, K. Nakamura
Central Research Inst. of Electric Power Industry, Japan

P/THME/07 - Modelling for the long-term Mechanical and Hydraulic behaviour of bentonite-based materials considering chemical transitions
F. Sahara1, T. Murakami1, I. Kobayashi1, M. Mihara2, T. Oh2
1 KAJIMA Corporation, Japan / 2 JAERI - Japan Atomic Energy Agency, Japan

P/THME/08 - Coupled thermal–hydro analysis on partially saturated bentonite
J.-D. Lu1, W.-H. Huang2, W.-Y. Lee2, I.-H. Sui2
1 Inst. of Nuclear Energy Research, Longtan, Taiwan / 2 National Central Univ., Taiwan

P/THME/09 - Behaviour of a bentonite barrier in the laboratory: experimental results up to 8 years and numerical simulation
M.V. Villar1, M. Sánchez2, A. Gens3
1 CIEMAT, Spain / 2 Univ. of Strathclyde, UK / 3 Univ. Politécnica de Catalunya, Spain

P/THME/10 - Coupled hydrogeochemical calculations of the interactions of corrosion products and bentonite
J. Samper, C. Lu, L. Montenegro
Univ. La Coruña, Spain

P/THME/11 - Freezing in saturated bentonite – A thermodynamic approach
M. Bärgersson, O. Karnland, U. Nilsson
Clay Technology AB, Sweden

P/THME/12 - Mechanical modeling of MX-80 - Development of constitutive laws
M. Åkesson, O. Kristensson
Clay Technology AB, Sweden

P/THME/13 - Mechanical modeling of MX-80 - Quick tools for BBM parameter analysis
M. Åkesson, O. Kristensson
Clay Technology AB, Sweden

P/THME/14 - TBT_3 Mock-up test-experimental and model results
M. Åkesson1, C. Gatabin2
1 Clay Technology AB, Sweden / 2 CEA, France

P/THME/15 - Suction characteristics of two compacted bentonite
S.R. Yang, W.H. Huang, T.H. Hsiao
National Taiwan Univ. of Science and Technology, Taiwan

P/THME/16 - Retention curves and volume change properties of unsaturated mx-80 bentonite – a laboratory study
A. Dueck, U. Nilsson
Clay Technology AB, Sweden

P/THME/17 - Humidity induced swelling and water absorption rate of highly compacted bentonite
A. Dueck, M. Lönnqvist, R. Goudarzi, L. Borgesson
Clay Technology AB, Sweden

P/THME/18 - Unconfined compression tests on bentonite samples exposed to high temperature during long time in the field test lot
A. Dueck, O. Karnland, U. Nilsson
Clay Technology AB, Sweden

P/THME/19 - Thermophysical properties of bentonite
M. Plötze1, U. Schärl2, A. Koch3, H. Weber4
1 Inst. for Geotechnical Engineering, Switzerland / 2 Ing.-büro Schärli, Switzerland / 3 RWTH Aachen, Germany / 4 Nagro, Switzerland

P/THME/20 - Geochemistry and mineralogy of a bentonite subjected to heating and hydration in an in-situ test after five years operation
A.M. Fernández, P. Rivas, A.M. Melón, M.V. Villar
CIEMAT, Spain

P/THME/21 - LOT project. Long term test of buffer material at Aspö: a Mössbauer spectroscopic study
Embae Ferrow
Lund Univ., Sweden

P/THME/22 - Self-sealing properties of buffer material under saline condition
S. Suzuki1, M. Sazafari1, T. Takegahara2, H. Takao2
1 Nuclear Chemistry and Chemical Engineering Center, Japan / 2 JGC Corporation, Japan

P/THME/23 - A study on extrusion behaviour of buffer material into fractures using X-ray Ct method
K. Tanai, K. Matsumoto
Japan Atomic Energy Agency, Japan

P/THME/24 - ESDRED Project, module 1 - Selection and THM characterisation of the Buffer Material
C. Gatabin, G. Touzé, C. Imbert, W. Guillot, P. Billaud
CEA, France
## SESSION: H, HM, AND THM-C PROCESSES IN NATURAL BARRIERS (THMN)

**P/THMN/01 - Three Dimensional analyses of combined gas, heat and nuclide transport in a repository considering coupled thermo-hydro-geomechanical processes**

V. Javeri  
GRS, Germany

**P/THMN/02 - Experimental study on the thermo-hydro-mechanical behaviour of boom clay**

T.T. Le¹, Y.-J. Cui¹, P. Delage¹, X.-L. Li²  
¹ENPC/CERMES, France / ²ESV EURIDICE GIE, Belgium

**P/THMN/03 - Hydraulic in-situ measurements in the opalusin clay in the frame of a heater test performed at the Mont Terri URL**

K. Wieczorek, N. Jockwer  
GRS, Germany

**P/THMN/04 - Hydro-mechanical behaviour of natural boom clay in controlled-suction tests**

E. Romero¹, A. Lima¹, A. Gens¹, X.L. Li²  
¹Univ. Politécnica de Catalunya, Spain / ²EIG, EURIDICE, Belgium

**P/THMN/05 - A constitutive approach to address the thermal and hydric impacts in the concept of deep radioactive waste repositories**

B. Francois¹, M. Nuth¹, L. Lalou¹  
¹Ecole Polytechnique Fédérale de Lausanne, Switzerland

**P/THMN/06 - Numerical analysis on stability of boom clay tunnel by shield construction**

W. Chen¹, S. Jia¹, H. Yu¹, G. Wu¹, X. Li², F. Bernier²  
¹Chinese Academy of Sciences, China / ²SCK-CEN, Belgium

**P/THMN/07 - A thermo-hydro-mechanical model for clay in unsaturated conditions**

W. Chen, X. Tan, G. Wu, S. Jia  
Chinese Academy of Sciences, China

**P/THMN/08 - 3D modelling of TER experiment accounting for fully anisotropic thermo-poro-elastic behaviour**

R. Giot¹, D. Hoxha¹, A. Giraud¹, F. Homand¹, K. Su², C. Chavant³  
¹Univ. Nancy, France / ²Andra, France / ³EDF R&D, France

**P/THMN/09 - Hydromechanical modeling of shaft excavation in Meuse/Haute-Marne laboratory**

G. Duveau¹, Y. Jia¹, K. Su², J. F. Shao¹  
¹Laboratoire de Mechanics of Lille, CNRS, France / ²Andra, France

**P/THMN/10 - Modelling of drying damage in engineered and natural clay barriers for nuclear waste disposal**

H. Peron¹, L. Lalou¹, T. Hueckel², L.B. Hu²  
¹Swiss Federal Inst. of Technology Lausanne, Switzerland / ²Duke Univ., USA

**P/THMN/11 - Elastoviscoplastic behaviour of Meuse/Haute-Marne argillite: laboratory tests and modelling**

D. Hoxha¹, C. Auveray¹, A. Giraud¹, F. Homand¹, K. Su²  
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**P/THMN/12 - Long-term behaviour of a lime treated soil under percolation conditions**

B. Leguiller¹, O. Cuisinier¹, V. Ferber¹, Y.J. Cui², D. Deneele¹  
¹Laboratoire Central des Ponts et Chaussées, France / ²École Nationale des Ponts et Chaussées, France

**P/THMN/13 - Stress redistribution and hydromechanical effects due to excavation and drilling operations in TER experiment**

L. Uhlig¹, M. Jobmann¹, M. Polster¹, J. Vaunat², B. Garritte², Y. Willeveau²  
¹DBE TECHNOLOGY GmbH, Germany / ²Univ. Politécnica de Cataluna, Spain / ³Andra, France

**P/THMN/14 - Thermodynamic model on swelling of bentonite buffer and backfill materials**

H. Sato  
JAEA, Japan

**P/THMN/15 - 3D analysis of a heating test in the Opalusin clay**

A. Gens¹, B. Garritte¹, J. Vaunat¹, Y. Willeveau²  
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**P/THMN/16 - THM analysis of a “mock-up” laboratory experiment using a double-structure expansive model**

A. Jacinto¹, M. Sánchez², A. Ledesma¹  
¹Tech. Univ. of Catalunya, Spain / ²Univ. of Strathclyde, U.K.

**P/THMN/17 - Measurement of the effect of reconfinement on rock properties around a slot**

J. Morel¹, C. Ballard², G. Armand¹  
¹Andra, France / ²INERIS, Ecole des mines de Nancy, France

**P/THMN/18 - Laboratory Study of desaturation - resaturation effects on a claystone**

D. Nguyen Minh, F. Vales, Q.T. Pham, H. Gharbi  
Ecole Polytechnique, France.
P/THMN/19 - Deformation induced by dissolution of salts in porous media
N. Mokni1, S. Olivella1, X. Li2, S. Smets3, E. Valcke3
1 Univ. Politécnica de Catalunya, Spain / 2 EIC EURIDICE, Belgium / 3 SCK-CEN, Belgium

P/THMN/20 - Bentonite swelling pressure in pure water and saline solutions
O. Karland
Clay Technology AB, Sweden

P/THMN/21 - Mineralogy and sealing properties of various bentonites and smectite-rich clay materials
O. Karland1,2, U. Nilsson1, S. Olsson3, P. Sellin4
1 Clay Technology AB, Sweden / 2 Lund Univ., Sweden / 3 Geochimica, Sweden / 4 SKB, Sweden

P/THMN/22 - Evaluation of the geochemical processes occurred in the opalinus clay formation subjected to a ventilation test
A.M. Fernández1, A.M. Melón1, M.V. Villar1, M.J. Turrero1, B. Garitte2, L. do. N. Guimaraes3, A. Gens2, J. C. Mayor4
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P/THMN/23 - Soil structure considerations in description of compacted and natural clay behaviour
A. Koli, L. Laloui, L. Vulliet
Ecole polytechnique fédérale de Lausanne, Switzerland

P/THMN/24 - The hydro-mechanical behaviour of Tunisian clayey soil used as discharge site of acidic waste
N. Hamdi1, A. Marzouki2, E. Srasra1
1 Unité matériaux, Technopole Boy Cedria, Tunisia / 2 Département génie civil, ISET Rades, Tunisia

P/THMN/25 - Consolidation and rebound properties of Opalinus clay: a long-term, fully-drained test
R.J. Cuss1, J.F. Harrington1, D.J. Noy1, D.J. Birchall1, P. Marschall2
1 British Geological Survey, UK / 2 Nagra, Switzerland

P/THMN/26 - Multidimensional modeling of a poro-elastic medium: identification of the behaviour of a clay formation from a stochastic representation of piezometric fluctuations
A. Mallet1, R. Ababou1, J.M. Matray2
1 Institut de Mécanique des Fluides de Toulouse, France / 2 IRSN, France

P/THMN/27 - Various approaches for the comprehension of the time-dependent behaviour of Callovo-Oxfordian argilite
Y. Renaud1, T. Maison1, Y. Wileveau2, G. Armand2
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P/THMN/28 - A new approach of estimating the influence of drilling mud on the borehole pressure history
C. Enachescu, B. Frieg, S. Rohs, B. Paris
Golder Associates, Germany

P/THMN/29 - Thermo-chemical-hydro-mechanical modelling: contributions to the assessment of the long term behaviour of a nuclear waste disposal in a deep clay formation
J.C. Robinet1, T.D. Bui2, J.D Barnichon2, F. Plas2
1 EGC Euro-Geomat-Consulting, France / 2 Andra, France

P/THMN/30 - Impact of thermal load on the far field and galleries of a repository
G. Klubertanz1, M. Folly1, P. Hufschmied1, E. Frank2
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