Contents

NORRIS, S. Clays in Natural and Engineered Barriers for Radioactive Waste Confinement: an introduction 1


Large scale geological characterization

BEERTEN, K., DE CRAEN, M. & LETERME, B. Long-term evolution of the surface environment of the Campine area, northeastern Belgium: first assessment 33

DELCOURT-HONOREZ, M. & SCHOLZ, E. Earth tidal and barometric responses observed in the Callovo-Oxfordian clay Formation at Andra Meuse/Haute-Marne Underground Research Laboratory 53

Clay based concept/Large scale experiments


GAUS, I., WIECZOREK, K., SCHUSTER, K., GAITTE, B., SENGEL, R., VASCONCELOS, R. & MAYOR, J. C. EBS behaviour immediately after repository closure in a clay host rock: HE-E experiment (Mont Terri URL) 71

LANYON, G. W., MARSCHALL, P., TRICK, T., DE LA VAISSEIRE, R., SHAO, H. & LEUNG, H. Self-sealing experiments and gas injection tests in a backfilled microtunnel of the Mont Terri URL 93


Hydrodynamical modelling

BENEIT, L.-V., BOUILLET, C. & WENDLING, J. Analysis of the ambient conditions in an IL-LLW storage cell in a deep clay repository during the waiting closure period 145

VANDERSTEEN, K., GEDEON, M., MARIVOET, J. & WOUTERS, L. Regional groundwater flow modelling of the confined aquifers below the Boom Clay in NE Belgium 163

Geochemistry

MELESHYN, A. Microbial processes relevant for the long-term performance of high-level radioactive waste repositories in clays 179
CONTENTS

DYMITROWSKA, M., PAZDNIAKOU, A. & ADLER, P. M. Two-phase-flow pore-size simulations in Opalinus clay by the Lattice Boltzmann Method 195

VINSOT, A., LEVEAU, F., BOUCHET, A. & ARNOULD, A. Oxidation front and oxygen transfer in the fractured zone surrounding the Meuse/Haute-Marne URL drifts in the Callovian–Oxfordian argillaceous rock 207

TAKAYAMA, Y., TSURUMI, S., KOBAYASHI, I., OHWADA, H., ISHI, T., YAHAGI, R. & IZUKA, A. Effect of montmorillonite content on mechanical and hydraulic properties of bentonite and its numerical modelling 221

WERSIN, P. & BIRGERSSON, M. Reactive transport modelling of iron–bentonite interaction within the KBS-3H disposal concept: the Olkiluoto site as a case study 237

Geomechanics

MALMBERG, D. & KRISTENSSON, O. Thermo-hydraulic modelling of the bentonite buffer in deposition hole 6 of the Prototype Repository 251

YILDIZDAG, K., SHAO, H., HESSER, J., NOIRET, A. & SOENNKE, J. Coupled hydromechanical modelling of the mine-by experiment at Meuse-Haute-Marne underground rock laboratory France 265


HAUSMANNova, L. & VASICEK, R. Measuring hydraulic conductivity and swelling pressure under high hydraulic gradients 293

GRAHAM, C. C., HARRINGTON, J. F., CUSS, R. J. & SELLIN, P. Pore-pressure cycling experiments on Mx80 Bentonite 303

KOBAYASHI, I., SUZUKI, K., ASANO, H., SELLIN, P., SVEMAR, C. & HOLMQVIST, M. Mechanical interpretations of the homogeneous nature of bentonite due to swelling 313

ZHANG, C.-L. Characterization of excavated claystone and claystone–bentonite mixtures as backfill/seal material 323

ABABOU, R., CANAMÓN, I. & POUTREL, A. Equivalent upscaled hydro-mechanical properties of a damaged and fractured claystone around a gallery (Meuse/Haute-Marne Underground Research Laboratory) 339

XU, W. J., SHAO, H., HESSER, J. & KOLDITZ, O. Numerical modelling of moisture controlled laboratory swelling/shrinkage experiments on argillaceous rocks 359

DELERUYELLE, F., BUI, T. A., WONG, H. & DUPOUR, N. Analytical modelling of a deep tunnel in a viscoplastic rock mass accounting for a simplified life cycle and extension to a particular case of porous media 367

CZAIKOWSKI, O., MIEHE, R. & ROTHFUCHS, T. Self-sealing barriers of sand/clay mixtures – lessons learnt from in situ experiment and retrospective modelling 381

PRIYANTO, D. G., DIXON, D. A., KIM, C.-S., KÖRKEAKOSKI, P. & VILLAGRAN, J. E. Preliminary modelling of the saturation of a full-sized clay and concrete shaft seal 399
BENET, L.-V., TULITA, C., CALSYN, L. & WENDLING, J. Evolution of temperature and humidity in an underground repository over the operation period

Mass transfer/Gas transfer


BENET, L.-V., TULITA, C., PASTEAU, A. & WENDLING, J. Analysis of the long-term hydraulic-gas transient in the central zone of a deep clay repository

BENNETT, D. P., CUSS, R. J., VARDON, P. J., HARRINGTON, J. F. & THOMAS, H. R. Phenomena exposure from the large scale gas injection test (Lasgit) dataset using a bespoke data analysis toolkit

CUSS, R., HARRINGTON, J., GIOT, R. & AUVRAY, C. Experimental observations of mechanical dilation at the onset of gas flow in Callovo-Oxfordian claystone

NAMIKI, K., ASANO, H., TAKAHASHI, S., SHIMURA, T. & HIROTA, K. Laboratory gas injection tests of compacted bentonite buffer material for TRU waste disposal

SENGER, R., ROMERO, E., FERRARI, A. & MARScHALL, P. Characterization of gas flow through low-permeability claystone: laboratory experiments and two-phase flow analyses

TAWARA, Y., HAZART, A., MOrI, K., TADA, K., SHIMURA, T., SATO, S., YAMAMOTO, S., ASANO, H. & NAMIKI, K. Extended two-phase flow model with mechanical capability to simulate gas migration in bentonite


Mass transfer mechanisms

SAVOYE, S., IMBERT, C., FAYETTE, A. & CoELHO, D. Experimental study on diffusion of tritiated water and anions under variable water-saturation and clay mineral content: comparison with the Callovo-Oxfordian claystones

HARRINGTON, J. F., VOLCKAERT, G. & NOY, D. J. Long-term impact of temperature on the hydraulic permeability of bentonite

GONDOLLI, J. & VEČERNÍK, P. The uncertainties associated with the application of through-diffusion, the steady-state method: a case study of strontium diffusion

WEETJENS, E., MAES, N. & VAN RAVESTYN, L. Model validation based on in situ radionuclide migration tests in Boom Clay: status of a large-scale migration experiment, 24 years after injection

Index