

General conclusions on THM behaviour of Praclay Mixture

- THM behaviour has been well characterised
 - Thermal behaviour : thermal conductivity seems not depend highly on the water content due to its high intrinsic value
 - Hydraulic behaviour :
 - Water Permeability depends strongly on the density, saturation/suction and temperature as most swelling clayed materials
 - Water retention doesn't depend strongly on the temperature when temperature is under 100 °C
 - Very difficult to reach the saturation ! (?)
 - Mechanical behaviour :
 - Volumetric aspects :
 - Swelling capacity is sufficient high as expected , the effect of additives of the sands and graphite is expected also ! It depends highly on the density and decreases slightly with temperature.
 - Collapse potential under hydration is very limited. In any case, the swelling dominates the volumetric deformation.
 - Viscosity ??
 - Deviatoric aspects
 - The cohesion and shear strength increase with the suction
- THM behaviour of such mixture is very complex : microstructure, retention, characteristic time etc.
- The OPHELIE test (5 years) affected only slightly the THM parameters of Praclay mixture

- General THM behaviour
 - Hydration :
 - Operating hydration procedure has an important influence on the global THM responses of the mock-up
 - Importance of the joints on the global THM behaviour
 - Heating :
 - Simple heat transport by conduction in the mixture is not sufficient to explain the apparent high thermal conductivity (weak T gradient)
 - Thermal convection (through the joints, presence of the sand layer at the bottom of the mock-up cover side)
 - Swelling :
 - Total gap was filled due to the swelling of the mixture, it was bigger than expected and may diminish the global swelling pressure
 - Small swelling pressures were measured, but the total saturation was not reached
- Lesson learned
 - The importance of the design on the global comprehension of the system
 - Impact of the joints on the THM behaviour