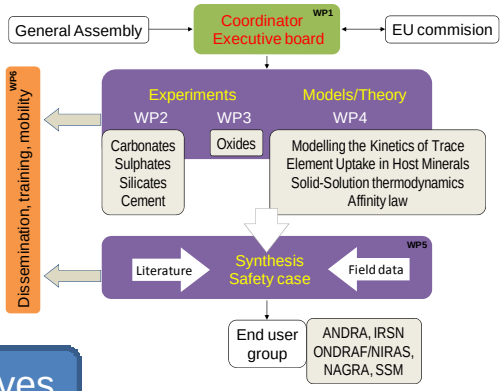
Slow processes in close-to-equilibrium conditions for radionuclides in water/solid systems of relevance to nuclear waste management

A 7th FRAMEWORK PROGRAMME COLLABORATIVE PROJECT (2008-2012)

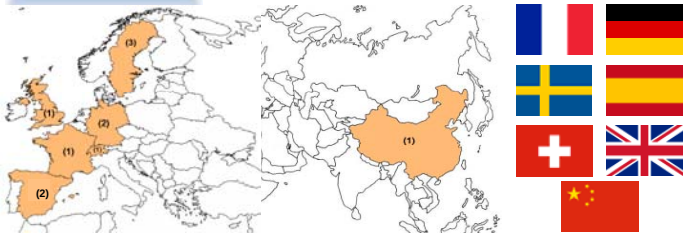
Pr. Bernd Grambow, Coordinator
Subatech Laboratory, 4 rue Alfred Kastler, 44307 Nantes, France; grambow@subatech.in2p3.fr

Presentation

SKIN is a 3-years collaborative project focused on the study of very slow processes that can impact on the mobility behaviour of radionuclides from the source term, the near field and the geosphere



Partners



5 EU Member States: France, Germany, Sweden, Spain, United Kingdom
1 Associated Country: Switzerland
1 Other Country: China
1 associate group: Spain
End user group : ANDRA, ONDRAF/NIRAS, NAGRA, SSM and IRSN

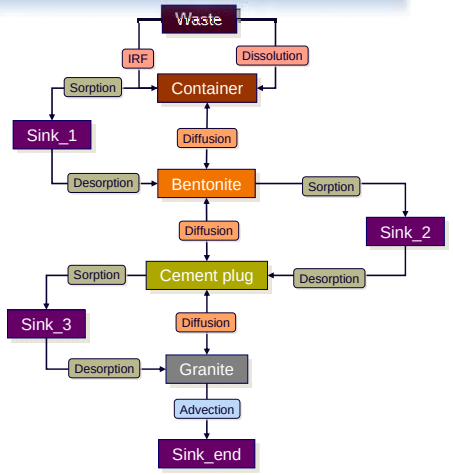
Objectives

- **To assess** the use/misuse of solubility data of sparingly soluble tetravalent actinides
- **To understand** the coupling of major and trace element chemistry in RN migration behavior considering the extremely large exchange pool of natural minerals present in the disposal sites
- **To include** irreversibility in models on the mobility of RN in the repository environment
- **To assess**, in PA to what degree the ignorance/non-inclusion of these studied slow processes leads to over-conservative evaluations, or in few cases, even too optimistic evaluations

Compartmental modelling approach

Irreversible processes

New solubility
Sorption data



Determining the impact of the studies done in the frame of the SKIN project over the calculations that support safety assessment procedures.

Programme structure and Activities

- *Identification of*
  - the substitution scheme for complex metal ion substitutions
  - ion binding (precipitation, co-precipitation, surface uptake) in complex cement related systems
- *Questions of reversibility*
  - solid/solution interaction with clays
- *Assessment of*
  - the kinetics of dissolution of tetravalent oxides under quasi-equilibrium conditions
  - the impact of major systems present in the repository environment on the rate of dissolution of matrix-related material and retention/release of radionuclides.

Present status

Start of the project: January 1st, 2011
Kick-Off Meeting: February 1st, 2011, France
1st annual workshop: November 17th-18th, 2011, AMPHOS 21
2nd annual workshop: November 21th-22th, 2012, PSI
1st Proceeding: http://www.emn.fr/z-subatech/skin
Publication: Holliday et al. Dalton Trans., 2012, 41, 3642-3647
Participation to conferences: NUWCEM'11, Migration'11, Goldschmidt'12