

Course unit : MODELLING OF FLUIDS/CLAYS INTERACTIONS IN THE ENVIRONMENT (28h – 3 ECTS – elective)

Content

This course unit focuses on computer modelling and/or experimental of fluid-clays interactions. 3 items are developed :

- the thermodynamic modelling
- the kinetic modelling of the precipitation of clay minerals (1) with fixed composition, (2) with variable composition
- from experiments to modelling on chlorite minerals.

Summary

Thermodynamic modelling of fluids/clays interactions :

- clay solid-solution models
- ionic exchange processes on clay minerals
- sorption processes on clay minerals

Kinetic modelling of fluids/clays interactions :

- Kindis model : modelling of equilibrium (clay mineral assemblage).

- Nanokin model : geochemical computer model for dissolution and growth in aqueous solutions. Prediction of the evolution of clay phases : particle size and chemical variability.

From experiments to modelling :

- experimental alteration of Al-Mg silicates under high temperature gradient.

Learning outcomes

The objective of this course unit is to provide the students with

- i) an updated background in thermodynamic and kinetic modelling of fluids/clays interactions.
- ii) a thorough understanding of the existing models, their specificity, their application domain
- iii) competences in experimental alteration and coupling with modelling

Horary

Lecture : 14h

Supervised works : 14h

Additional seminars

Evaluation

Final examination : 50% of the mark

Laboratory report : 50% of the mark

Teaching staff

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