Course unit : THERMODYNAMIC FUNCTIONS : EXPERIMENTAL AND THEORETICAL APPROACHES (28h – 3 ECTS – compulsory)

Content

The module includes fundamental aspects of thermodynamics, practical works about calorimetric and solubility measurements, the use of calorimetry for clay minerals and estimation methods.

Part 1 : Fundamentals, reference states, mass action law, solubility, predominance diagrams, thermodynamic databases
Part 2 : Experimental measurements of thermodynamic constants by calorimetry
Part 3 : Methods of prediction applied to thermodynamic properties of clays minerals : enthalpy , Gibbs free energies, entropy and heat capacity

It ends with a presentation of a thermodynamic database, including database management aspects.

Learning outcomes

The module aims to understand the different processes that can be implemented in order to acquire a thermodynamic constant, either by experimental or by estimation means. The goal is also to understand the relations between the main thermodynamic constants and their practical use for clay minerals, namely for geochemical modelling purposes.

Horary

Lecture : 14 h
Supervised works : 8 h
Practical works : 6 h

Evaluation

Final examination : 50% of the mark
Evaluation during the teaching period : 50% of the mark

Teaching staff

Philippe Blanc (B.R.G.M., Orléans)
Hélène Vigier (B.R.G.M., Orléans)
Philippe Vieillard (CNRS, Poitiers)
Emmanuel Tertre (University of Poitiers)