

## Course unit : CRYSTAL GROWTH AND MECHANISMS OF CLAY FORMATION (56h – 6 ECTS – compulsory)

### Content

Fundamentals of crystal growth. Crystal growth in materials and earth sciences. Thermodynamic backgrounds. Equilibria in condensed systems; equilibrium morphology of a crystal. Departures from equilibrium. Kinetics of crystal growth and resorption; homogenous and heterogenous nucleation, growth rates of individual faces and their structure. Collective behaviour of crystal populations; ripening, textures. Applications to layer silicates. Modes of transformations. Crystal growth methods and practice of solution growth.

Synthesis of clay and Hydroxide Double Lamellar minerals

### Horary

Lecture : **28 h**  
Supervised works : **14 h**  
Practical works : **14 h**

### Learning outcomes

To read and interpret the growth history of crystals from their surface and volume characterization. Practice of crystal growth in solution to decipher conditions of good crystallinity.

Practical of clay and Hydroxide Double Lamellar minerals synthesis

### Evaluation

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

### Teaching staff

Alain Baronnet (University of Aix-Marseille),  
Olivier Grauby, (University of Aix-Marseille)  
Vanessa Prevost (University of Clermont Ferrand)  
Marc Reinholdt (University of Poitiers)