

Course unit : GEOLOGICAL SYSTEMS : CLAYS IN THE EARTH'S CRUST (56h + Field trip – 9 ECTS – elective)

Content

This course unit focuses on occurrence and formation/transformation processes of clay minerals in geological systems from the sub-surface (at the exclusion of soils which are studied in a specific course unit).

In each studied geological system, the lectures will emphasize the use of clay minerals and altered rocks characteristics as markers of the fluid/rock interactions processes and associated paleoconditions.

Summary

Oceanic clays : origin and transformation of clay minerals in oceanic environments (detrital clays, diagenetic clays, hydrothermal clays)

Continental clays :

- Origin, mineralogical composition and functioning of weathering profiles under tropical or inter tropical climate

- Alteration processes and genesis of clay minerals in fossil hydrothermal systems and in active geothermal areas

- Transformation series in sedimentary basins : the example of the silicoclastic diagenesis

This course unit includes a field trip and practical works

Learning outcomes

The objective of this course is to provide the students with an updated background in alteration petrology and clay mineralogy in domains of importance for both fundamental and applied research (natural resources and energies: base metals, fossil energy and geothermy...)

The investigated geological domains are : the surficial weathered rocks, geothermal systems, hydrothermal systems (continental and oceanic), sedimentary basins and diagenesis.

Horary

Lecture : 14h

Supervised works : 7h

Practical works : 7h

Field trip : 28h

Additional seminars

Evaluation

Final examination : 50% of the mark

Field trip report : 25% of the mark

Laboratory report : 50% of the mark

Teaching staff

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