Development of synthesis strategy to study the acidity of lamellar compounds

Summary

Clay minerals are used as solid catalysts for numerous organic reactions. In several reactions, the catalytic activity is related to the effective acidity of the catalytic material. The acidity is defined as the electron deficient character of the carrier. On clay minerals different electron deficient sites exist in the interlayer, on basal and edge surfaces. Understanding the contribution of each type of site to clay mineral acidity could help in conception of highly efficient catalysts.

The intern will develop synthesis of clay minerals with different amount of acid sites. The characterization of synthesis products will be performed by XRD, FTIR and NMR. The acidity will be assessed by studying the interactions "surface – probe molecule" that find a privileged place in the characterization of many materials. The intern will carry out the adsorption of liquid molecule probes by calorimetry and measure the interaction energies involved.

Required Skills

- General knowledge in analytical chemistry analysis.
- Experience and / or interest in the synthesis of solid materials.
- Fluent in English.
- Curiosity, critical thinking, organizational and analytical skills, taste for laboratory experimentation

Supervisors and host laboratory

Liva Dzene (liva.dzene@uha.fr) et Simona Bennici (simona.bennici@uha.fr)
Institut de Science des Matériaux de Mulhouse
IS2M - CNRS UMR 7361 - UHA
15, rue Jean Starcky-BP 2488
68057 Mulhouse cedex, FRANCE

Duration and gratification

6 months (starting on February 2017)
According to currently defined amount