



Precursors of ferrous phyllosilicates

Description of the internship:

In some engineered systems, material damage or loss of performance due to corrosion or deposit formation can occur when silicic and ferrous species are present in solution. Formation of phyllosilicates may occur, leading to further material degradation. The environmental conditions (aqueous concentrations, pH, Eh, temperature, etc.) for the formation of these phases are poorly understood [1,2]. **The objective of the internship will be to identify the precursors for the formation of iron-rich phyllosilicates.** For this, an analysis of the solution *in-situ* will be carried out during the aging phase (Eh, pH, conductivity), followed by the analysis of the solution *ex-situ* after separation of the precipitates from the supernatant (atomic absorption spectroscopy , uv-vis spectroscopy). These analysis will be supplemented by an analysis of the synthesis products (X-ray diffraction, transmission electron microscopy, chemical analysis) and compared to the models obtained from mass balance equations.

[1] Dzene, L., Brendlé, J., Limousy, L., Dutournié, P., Martin, C. & Michau, N. Applied Clay Science, **166**, 276–287 (2018).
[2] Boumaiza, H., Dutournié, P., Le Meins, J.-M., Limousy, L., Brendlé, J., Martin, C., Michau, N. & Dzene, L. Applied Clay Science, **199**, 105876 (2020).

Candidate profile:

Master 2 student with knowledge of chemistry and physico-chemistry of materials.

Required skills:

- Curiosity, critical thinking, organizational skills, interest for laboratory experimentation;

- Experience and/or interest in the synthesis and characterization of materials and minerals;

- General knowledge of analytical chemistry;
- Fluency in English and French.

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