Setting of Mineral foams probed by infrared Spectroscopy

1-year postdoc position

**Keywords:** foams, colloids, dissolution/precipitation, mineral materials, IR spectroscopy

A one year postdoc position in Lyon, France is available at the [Institute of Light and Matter](http://www.ilm.univ-lyon1.fr) (iLM) in University of Lyon, France in the Liquids and Interfaces group. The position is funded by the Institute of Chemistry of CNRS through the Emergence@INC2020 program.

Foaming and solidifying a suspension of reactive grains, e.g. a fresh cement paste, is a convenient and attractive way to elaborate mineral porous materials that reduce drastically our energy demand: less raw material, no high temperature sintering and improved thermal insulation for building materials. However, to tune their mechanical and thermal properties, it is crucial to control the material structure (cell size, open or closed cells, etc), which itself results from the interplay between the foam aging and the dynamics of mineral setting, proceeding through a dissolution-precipitation mechanism. However, we do not know so far the respective roles of physical parameters, in particular the confinement induced by the foam geometry, and physico-chemistry (surfactant-grain interactions) on the solidification process.

The objective of the project is therefore to probe the kinetics of dissolution-precipitation in a foamed mineral (plaster or calcium carbonate) paste by using Fourier Transform InfraRed (FTIR) spectroscopy. The role of the postdoc will be to set up the foam samples to demonstrate the feasibility of the infrared measurements, before exploring the role of bubble and mineral particle sizes, as well as surfactant charge. The postdoc will work in the Liquids and Interfaces team, experts of soft matter and foam dynamics, in close collaboration with the SOPRANO team for the expertise on spectroscopy measurements.

The candidate should be a motivated experimentalist, with a PhD obtained since less than 5 years in soft matter, spectroscopy or material science. Specific knowledge in foams, colloidal physico-chemistry or mineral materials will be considered favorably but is not required. This project will take place in iLM, campus de la Doua, Villeurbanne (very close to the city center of Lyon, France). This is a one year CNRS contract starting no later than March 1st 2019. Charged salary starts from 2643€ per month depending on experience. Applications on CNRS portal before Feb 11 2020 [http://bit.ly/2tC2Hkd](http://bit.ly/2tC2Hkd) should include a CV, a motivation letter and some references. They will be considered until the position is filled. For information, please contact Marie Le Merrer by email: marie.le-merrer@univ-lyon1.fr

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1 Liberto et al. JCIS 2019, Le Merrer et al. PRL 2012
2 Farlay et al. J Bone Miner Metab 2010