
Physico-chemical and structural transformations under shock of hydrated minerals

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Abstract

My thesis is linked to the sustainability of hydrated glasses. The main objective is to study the fate of water contained in hydrated minerals under hypervelocity impact conditions. The methodology developed is established by studying silica glass, a material already referenced under impact (Thesis C. Dereure 2019). The focus here will be on the evolution of the material's density and variations in its hydration rate.

This implies many analyses of samples before and after impact experiments by characterization of hydration in depth, mostly with Raman Confocal Spectroscopy. For now, we are mostly focusing on the hydration process of glasses which can be obtained by diffusion and reaction of water in a high temperature and pressure atmosphere. The impact will be then produced by using the analogy between hypervelocity impact and laser-induced shock (Pirri 1977) and imply various national facilities like those of LULI laboratory (Laboratoire pour l'Utilisation des Lasers Intenses - UMR 7605 CNRS), equipped with in-situ diagnostics such as VISAR and umbroscopy.

The thesis is a part of the ANR SiCLAMEN.

Keywords: Silica glass, Choc, Water, Hydration, Sustainability, Silica glass, Hypervelocity impact, Mechanical properties

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