

## Relaxation Dynamics toward Crystallization in Amorphous Mineal Precursors

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Amorphous calcium carbonate (ACC) is a precursor to a wide variety of biominerals. Experimental and simulation studies suggest that the presence of water is the key in stabilizing ACC<sup>1,2</sup>, though its structure as well as the structural evolution toward crystallization remain still unclear. The present study investigates Mg-bearing ACC using X-ray photon correlation spectroscopy (XPCS). This technique takes advantage of coherent X-ray beams to enable the investigation of atomistic dynamics during ACC aging. It has been successfully used to study dynamics of metallic glasses and soft matter<sup>3</sup>.

Our results indicate a continuous slowing down of the relaxation dynamics during the course of the measurement due to gradual dehydration. It is to note that this decay in relaxation dynamics engendered no distinguishable changes in the static structure factor. The nature of the decay indicates that this Mg-bearing ACC systems undergo a “jamming” transition towards crystallization, accompanied by an increase in strains caused by gradual local ordering due to dehydration. The role of Mg on the stability and dynamics of ACC is shown using inelastic neutron scattering.

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