In-situ Observation of Lime Paste Carbonation in CO_2 Environment Scanning Electron Microscopy (ESEM)

Mileva Radonjic (1) and **Adrian Hughes** (2)

(1) University of Bristol, Interface Analysis Centre, 121. St. Michaels Hill, Bristol, UK
(2) Imerys Minerals Ltd., Central Research Lab., Par Moor, St. Austell, Cornwall, UK

Corresponding author email address: mileva.radonjic@bris.ac.uk

The setting of lime-based mortars is attributed to the process of carbonation but the rate and mechanism of this reaction has yet to be accurately defined experimentally.

Here we report an *in-situ* observation of the carbonation of lime paste within the analysis chamber of an Environmental Scanning Electron Microscope (ESEM). Changes in the microstructure of the lime paste surface induced by the flow of CO_2 or CO_2-rich water vapour have been carefully monitored during initial stages.

Initial results show not only the rate at which Portlandite converts to calcium carbonate but also the parameters influencing the mechanism of the reaction. Environmental scanning electron microscopy can provide in-situ microstructural and micro-chemical characterisation of the dynamic surface changes of materials exposed to various environments.