

## Synthesis and Structural Studies of the Ettringite Group of Minerals

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The ettringite group of minerals have the general formula  $\text{Ca}_6\text{X}_2(\text{SO}_4)_3(\text{OH})_{12} \cdot 26\text{H}_2\text{O}$ , where X = Al, Cr, Fe and Si and the sulphate group can be substituted by carbonate or borate groups. Although the minerals are compositionally closely related, structurally they are different. Ettringite and thaumasite are the most important members of the group as they form in cement pastes, mortars and concretes. This has major implications for the construction industry and further study into the structure of these compounds is required to address this issue.

A systematic study of the structural chemistry of Ettringite, thaumasite and their related phases is being undertaken using powder x-ray diffraction, single-crystal x-ray diffraction and neutron diffraction of both natural and synthetic samples. A detailed phase diagram exploration is one of the aims of our programme, to include analysis of synthetic analogues of these mineral phases and investigations into potential solid solutions that may exist between different members of the Ettringite group.

It is my intention to report on the progress of both our synthetic programme and structural investigations into these minerals.