

## **Long Term Durability of Coal Fly Ash Class C Belite Cement-Mortar Exposed to Sulphate Attack at 40°C**

A. Guerrero, S. Goñi

*Instituto de Ciencias de la Construcción "Eduardo Torroja"(CSIC), Madrid, España*

The durability of cement-based materials with respect to exterior aggressions is one of the current priorities in civil engineering. Depending on their use, the cement-based materials can be exposed to different types of aggressive environments. For instance, damages to concrete structures in contact with a sulphate and saline environment are of most importance.

Belite cements have excellent durability against determined expansive attacks and lower heat of hydration than that of Portland cements. These properties convert belite cements in good candidates for the immobilization of low level liquid wastes (LLW) and medium level liquid wastes (MLW). In this work, we present a long term durability study at 40°C of a kind of belite cement from coal fly ash class C as alternative raw material. The aggressive was a 0.5M sodium sulphate ( $\text{Na}_2\text{SO}_4$ ) solution, which is common in some evaporator concentrate solutions of MLW and LLW. The attack was evaluated by means of flexural strength changes of mortars over 180 days. Furthermore, the changes in microstructure were followed by mercury intrusion porosimetry and mineralogy by X-ray diffraction.