

Portland Cement Clinker Obtained Using CaF₂ and Anhydrite/Fly-Ash/EAFD Industrial By-Products

O. Dominguez¹, R. Torres¹, L.M. Flores²

¹*Instituto de Metalurgia-UASLP, San Luis Potosí, SLP/Mexico.*

²*Facultad de Química-UASLP, San Luis Potosí, SLP/Mexico.*

The imperative reduction of CO₂ emission is recognised in the Portland cement industry. In the present work, preliminary results on clinkerization reactions using as raw materials industrial by-products are presented. Different concentrations of Anhydrite, Fly-Ash and treated Electric arc furnace dust (EAFD) together with diverse amounts of CaCO₃/CaF₂ were mixed and sintered. High temperature reactions were characterized using powder X-ray diffraction, thermal analysis together with scanning electron microscopy. Thermal and x-ray results indicted that clinkering temperature required for satisfactory combination may be reduced by up to 200 °C when CaF₂ was incorporated in the raw materials. Finally, it was observed that after hydration of the cement clinker, the mechanical properties were meaningfully dependent on the amount of CaF₂ in the mix. Mean compressive strength of 40 MPa after curing samples for 7 days at 30 °C indicated equivalent properties to those of conventional Portland cement.