ANALYSIS OF CALCIUM ALUMINATE CEMENT PASTES

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July 7, 2020

Abstract

In this research different formulations of calcium aluminate cement pastes (CACP) with 71wt% Al₂O₃ (CACP 71wt%), (wt% -percentage by weight) were made, at 0.4 water to cement ratios (W/C), with additions of 0wt%, 10wt% and 20wt% of silica (CACP 71-0wt%, 10wt% and 20wt%, respectively). All samples were exposed to oxidative environment for 4 hours at 1000°C, in a furnace under an air atmosphere. Chemical and mineralogical characterization was done using X-ray fluorescence (XRF), X-ray diffraction (XRD) and Fourier-transform infrared spectroscopy (FTIR). The behavior of the constituent phases according to temperature was also studied, through thermal gravimetric analysis (TGA). Activation energies were calculated using Friedman's method. The values of the activation energies obtained for the formulation of CACP 71- 0wt% for different phases were in the range of 12.02 to 16.41 kJ/mol; and for the formulation of CACP 71-20wt% the values were in the range of 7.7 to 16.23 kJ/mol.

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