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Abstract

This paper reports the results of the study of the influence of elevated temperature curing on phase composition, microstructure and strength development in geopolymer materials prepared using Class F fly ash and sodium silicate and sodium hydroxide solutions. In particular, the effect of storage at room temperature before the application of heat on strength development and phase composition was studied. X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR) and SEM were utilised in this study.

Long precuring at room temperature before application of heat was beneficial for strength development in all studied materials, as strength comparable to 1 month of curing at elevated temperature can develop in this case only after 24 h of heat curing. The main product of reaction in the geopolymeric materials was amorphous alkali aluminosilicate gel. However, in the case of sodium hydroxide activator in addition to it, traces of chabazite, Linde Type A, Na-P1 (gismondine) zeolites and hydroxysodalite were also present. The type of zeolite present and composition of aluminosilicate gel were dependent on the curing history.

Introduction

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