Abstract

In this work, the effects of the molar ratios SiO2/Al2O3 (3.0 - 4.0) and Na2O/ SiO2 (0.25 - 0.40) on the compression strength and the autogenous shrinkage of geopolymers based on Metakaolin (MK) were investigated. 16 types of geopolymeric mixtures activated with a solution of sodium silicate and sodium hydroxide were evaluated. Compressive strength and autogenous deformations were recorded. The materials produced were characterized by using different techniques X-ray diffraction (XRD), Fourier transform infrared (FTIR) and thermogravimetry (TG / DTG). The results show that the properties of the geopolymers systems are affected by the proportions of Silicon (Si), aluminum (Al) and Sodium (Na) available on the mix, which in turn determines the microstructure of the material. The best mechanical performance at early age and the minimal contraction were obtained with a ratio of SiO2/Al2O3 3.0 and Na2O/SiO2(2)0.25.

Keywords

Geopolymer, metakaolin, alkali-activation, novel ceramics.