

Properties of metakaolin geopolymeric binder

Abstract

This paper investigates the physical and mechanical properties as well as the morphology study of the MKgeopolymeric binder. Mixture of waterglass liquid and NaOH solution were used as the activator solution for the activation of MK. The slurry was oven-heated to obtain solidified paste. It was then pulverized to obtain the geopolymeric binder. For testing, this geopolymeric binder was mixed with water ($\approx 22\%$) to form resulted geopolymer paste. The results indicated that the surface area of the MK geopolymeric binder was $9.76 \text{ m}^2/\text{g}$. The resulted geopolymer paste set in 420 minutes at 60°C . The bulk density of the resulted geopolymer paste was low ($1000 \text{ kg}/\text{m}^3$ - $1300 \text{ kg}/\text{m}^3$). The compressive strength of resulted MK geopolymer paste increased over age and the strength at 28 days was 9.58 MPa . In addition, the microstructures of the resulted geopolymer pastes displayed the increase of the spherical aggregates of geopolymer gel and the densification of the structure, which complied with the increasing strength.

Keywords

Bulk density; Compressive strength; Geopolymerization; Metakaolin opolymeric binder; Microstructure; Setting time