

Comparison of original and sintered LUSI mud from East Java, Indonesia as raw material for making a geopolymer

Abstract

This paper presents the characterization of LUSI mud from East Java, Indonesia, as a potential raw material for making a geopolymer. Two types of LUSI mud were analyzed, i.e., original LUSI mud and LUSI mud that had been sintered at 800 °C for 2 h. Tests were conducted using X-ray fluorescence (XRF), particle size analyzer (PSA), X-ray diffraction (XRD), scanning electron microscope (SEM), and Fourier transform infrared (FTIR) equipment to evaluate these raw materials. The particle size of the original mud and the sintered mud was in the range of 209-240 μm and 316-363 μm , respectively. The major constituent of both materials was SiO_2 , but the SiO_2 content was higher in the sintered mud than in the original mud. The SiO_2 peak for sintered mud was higher than the peak for original mud at $2\theta = 26.8^\circ$, due to the higher intensity of quartz. SEM analysis showed that both the original mud and the sintered mud had a plate-like structure similar to kaolin. The FTIR adsorption band showed slight difference between the original mud and the sintered mud.

Keywords

DSC; FTIR; Geopolymer; PSA; SEM; XRD; XRF