

Thesis Title	Effects of Alkaline Concentration and Curing Temperature on Strength Development of Geopolymer Synthesized from Bituminous Coal Fly Ash
Thesis Credits	12
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Program	Master of Engineering
Field of Study	Environmental Technology
Department	Environmental Technology
Faculty	School of Energy, Environment and Materials
Academic Year	2014

Abstract

This research investigated the effects of alkaline concentration and curing temperature on strength development of geopolymer synthesized from bituminous coal fly ash. $\text{Na}_2\text{O}/\text{SiO}_2$ of 0.2 and 0.25 by mol was studied using sodium hydroxide (NaOH) as alkali activator. Samples were cured under room temperature for 7, 14, 21 and 28 days and under controlled temperature at 50°C and 70°C in incubator for 24, 48 and 72 hours. Results showed that geopolymer synthesized from bituminous coal fly ash at $\text{Na}_2\text{O}/\text{SiO}_2$ of 0.2 and 0.25 by mol gave strength equal to 20 and 16 kg/cm^2 , respectively when cured under room temperature for 28 days. For samples curing at 50°C for 24 hours, strength was 85% higher compared to those curing under room temperature for 28 days but was 30% lower than curing at 70°C at $\text{Na}_2\text{O}/\text{SiO}_2$ of 0.2 by mol. It is observed that the increase curing time and temperature did not significantly affect strength of geopolymer with $\text{Na}_2\text{O}/\text{SiO}_2$ of 0.2 by mol. On the other hand, a decrease of strength was obtained from geopolymer with $\text{Na}_2\text{O}/\text{SiO}_2$ of 0.25 by mol. Results from XRD and SEM analysis showed that the crystalline of sodium aluminum silicate hydrate (NASH) was observed on the surface of samples, which corresponded to the strength development of geopolymer.

Keywords: Bituminous coal fly ash/ Compressive strength/ Curing temperature/ Geopolymer