

Evaluation of Fly Ash Stockpiles as Potential Source Material for Geopolymer Concrete

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ABSTRACT

Fly ash stock piles were evaluated as potential raw material for geopolymer concrete. Results of chemical analyses, X-ray diffraction (XRD) and particle size distribution (PSD) of five sources of fly ash obtained from co-generation plants in the U.S. are presented. Specimens were prepared from each stock pile using a mix design formulation determined to be effective from previous studies. The specimens were subjected to an array of chemical and mechanical tests including XRD, setting time, and compressive strength. A correlation study was undertaken comparing the chemical composition, the crystallographic properties and fly ash particle size distribution with the mechanical and chemical characteristics of the resulting geopolymer. Factors inherent to the fly ash like particle size distribution, degree of vitrification and location of the glass diffraction maximum were found to have great influence on the behavior and properties of the resulting geopolymer.