



“Gheorghe Asachi” Technical University of Iasi, Romania



INFLUENCE OF RAW MATERIALS CHARACTERISTICS AND PROCESSING PARAMETERS ON THE STRENGTH OF GEOPOLYMER CEMENTS BASED ON FLY ASH

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Abstract

The aim of this study was to assess the physical, chemical, mineralogical and microstructural characteristics of a group of Romanian fly ashes, in order to determine its reactivity as precursors for geopolymer cements preparation. Compressive strength test was used to assess the reactivity of the fly ashes vs. alkali solutions (sodium hydroxide and sodium silicate) and to optimize the geopolymer processing parameters. Several methods, such as thermal treatment, sieving of fly ashes or addition of metakaolin as solid component, were studied, in the attempt to increase the fly ashes reactivity vs. the alkali activator. The results obtained demonstrated that three out of four types of studied fly ashes are suitable to be used as solid component for geopolymer cements preparation; the removal of coarse fraction (consisting mainly in unburnt carbon) from fly ash, by sieving, improved the compressive strengths developed by the geopolymer mortar.

Key words: compressive strength, fly ash, geopolymer, metakaolin, thermal treatment

Received: September, 2010; Revised final: March, 2011; Accepted: March, 2011

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