

Process Modified Geopolymer Concrete: A Sustainable Material for Green Construction Technology

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Abstract : The fly ash based geopolymer concrete generally requires heat activation after casting, which has been considered as an important limitation for its practical application. Such limitation can be overcome by a modification in the process at the time of mixing of ingredients (fly and activator fluid) for geopolymer concrete so that curing can be made at ambient temperature. This process modified geopolymer concrete shows an appreciable improvement in structural performance compared to conventional heat cured geopolymer concrete and control cement concrete. The improved durability performance based on water absorption, sulphate test, and RCPT is also noted. The microstructural properties analyzed through Field Emission Scanning Electron Microscope (FESEM) with Energy Dispersive X-ray Spectroscopy (EDS) and X-ray Diffraction (XRD) techniques show the better interaction of fly ash and activator solution at early ages for the process modified geopolymer concrete. This accelerates the transformation of the amorphous phase of fly ash to the crystalline phase.

Keywords : fly ash, geopolymer concrete, process modification, structural properties, durability, micro-structures

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