

Preparation and Physical Assessment of Portland Cement Base Composites Containing Nano Particles

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Abstract : In this research the effects of adding silica and alumina nanoparticles on flow ability and compressive strength of cementitious composites based on Portland cement were investigated. In the first stage, the rheological behavior of different samples containing nanosilica, nanoalumina and polypropylene, polyvinyl alcohol and polyethylene fibers were evaluated. With increasing of nanoparticles in fresh samples, the slump flow diameter reduced. Fibers reduced the flow ability of the samples and viscosity increased. With increasing of the micro silica particles to cement ratio from 2/1 to 2/2, the slump flow diameter increased. By adding silica and alumina nanoparticles up to 3% and 2% respectively, the compressive strength increased and after decreased. Samples containing silica nanoparticles and fibers had the highest compressive strength.

Keywords : Portland cement, composite, nanoparticles, compressive strength

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