

Investigation of Zeolite and Silica Fume Addition on Durability of Cement Composites

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Abstract : Today, concrete belongs to the most frequently used materials in the civil engineering industry for many years. Consuming energy in cement industry is very high and CO₂ emissions generated during the production of Portland cement has serious environmental threatens. Therefore, utilization of pozzolanic material as a supplementary cementitious material has a direct relationship with the sustainable development. The paper presents the results of the comparative study of the resistance of the Slovak origin zeolite based cement composites with addition of silica fume exposed to the sulfate environment. The various aggressive media were used for the experiment: sulfuric acid with pH 4, distilled water and magnesium sulfate solution with a concentration of 3 g/L of SO₄²⁻. The laboratory experiment proceeded during 180 days under model conditions. The changes in the elemental concentrations of calcium and silicon in liquid leachates were observed.

Keywords : concrete, leaching, silica fume, sulfuric acid, zeolite

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