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# Analysis of Sulphur-Oxidizing Bacteria Attack on Concrete Based on Waste Materials

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**Abstract :** Concrete durability as an important engineering property of concrete, determining the service life of concrete structures very significantly, can be threatened and even lost due to the interactions of concrete with external environment. Bio-corrosion process caused by presence and activities of microorganisms producing sulphuric acid is a special type of sulphate deterioration of concrete materials. The effects of sulphur-oxidizing bacteria Acidithiobacillus thiooxidans on various concrete samples, based on silica fume and zeolite, were investigated in laboratory during 180 days. A laboratory study was conducted to compare the performance of concrete samples in terms of the concrete deterioration influenced by the leaching of calcium and silicon compounds from the cement matrix. The changes in the elemental concentrations of calcium and silicon in both solid samples and liquid leachates were measured by using X – ray fluorescence method. Experimental studies confirmed the silica fume based concrete samples were found out to have the best performance in terms of both silicon and calcium ions leaching.

**Keywords :** biocorrosion, concrete, leaching, bacteria
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