Some aspects of study the acid corrosion of Portland cement produced in Albania

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Abstract

Durability is an important engineering property of cement and concrete, which determines their service life. Their mechanical and physical properties may be lost due to interactions with external factors. Among different threatening factors, such as mechanical fatigue, freeze/thaw cycles, thermal stresses, chemical attack may also deteriorate the cement and concrete. Acid attack is particularly detrimental for cementitious material due to its alkaline matrix. This paper focuses on studying the durability of cement pastes from locally produced cement to ascertain their durability to withstand acidic environment degradation. Mass loss and porosity were measured after different times in aggressive solutions with different concentrations. It was concluded that the action of acid attack is dependent on the type of acid, acid concentration, w/c ratio and exposure time. The degradation was significant in long periods of contact time and higher concentrations of acid. Immersion in sulphuric acid leads to stronger attack for the studied samples.

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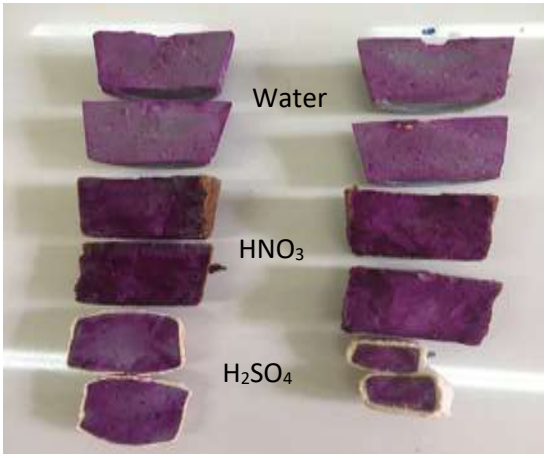

Figure 1. Acidic degradation of cement pastes, 3% acid concentration (left) and 5% acid concentration (right)