

Corrosion of Steel in Alkali-activated Slag Mortar

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The increase of the rebar corrosion rate due to the concrete carbonation is a major cause of reinforced material degradation. In this sense, the objective of this research was to study the corrosion behaviour of AAS reinforced mortars exposed to carbonation. Ordinary Portland Cement (OPC) and Alkali-activated Slag (AAS) mortars using Waterglass solution ($\text{Na}_2\text{SiO}_3 \cdot n\text{H}_2\text{O} + \text{NaOH}$) as activator were prepared. Steel bars embedded in OPC and AAS mortars, exposed to natural environment and accelerated carbonation chamber (30°C, 70%HR, 3% CO_2), were evaluated by electrochemical techniques (free corrosion potential evolution, linear polarisation resistance and impedance spectroscopy). It was obtained higher carbonation rates in AAS than in OPC mortars on basis of similar compressive strengths. Because higher carbonation depths, the steel embedded in AAS mortars was rapidly depassivated when is exposed to the carbonation chamber. It is noted that the performance differ depending on the chemical composition of the slag, such as alkalis content.