

Effect of benzotriazole derivatives on Steel corrosion in Solution Simulated Carbonated Concrete

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Abstract: The aim of this research was to develop corrosion protection systems for reinforced concrete structures under carbonation attack. Benzotriazole (BTA) and BTA derivatives were used as two separate protection systems: inhibition and pickling protection systems. The experiments were performed in Simulated Concrete Pore (SCP) solutions with and without severe carbonation attack. Electrochemical techniques, i.e. potentiodynamic polarization and electrochemical impedance were used to assess the steel corrosion protection systems. The potentiodynamic polarization studies showed a reduction in the corrosion rate and a shifting in the corrosion potential to more noble potential for the steel specimen in the simulated carbonated concrete solution. In addition, a large increase in the steel interfacial resistance was observed by Electrochemical Impedance Studies (EIS) due to the formation of steel-BTA derivative complex on the surface. BTA derivatives provided a good protection for the steel in SCP simulated carbonated concrete solutions. This study indicates the applicability of these compounds for steel corrosion protection in reinforced concrete structures.