

EFFECTIVENESS OF PRE-TREATMENT METHOD TO HINDER REBAR CORROSION IN CONCRETE

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ABSTRACT

The present work aims at evaluating the ability of phosphate pre-treatments applied on steel rebar's to hinder the corrosion reinforcements in a synthetic pore electrolyte contaminated by chloride ions and in mortar. The electrochemical behaviour of the pre-treated substrate was assessed by corrosion potential, polarization resistance and electrochemical impedance spectroscopy. The results have demonstrated that the treatment of the rebar by immersion in the Na_3PO_4 (0.5M) solution favours the formation of a passive layer on the steel rebar surface, which is able to resist higher concentration of chlorides, up to 0.3M, to initiate corrosion. The pre-treatment also provides enhancement of corrosion protection of the steel rebar in mortar. The evolution of the impedance spectra with respect in function of chloride concentration are in a fairly good agreement with the results obtained by E_{corr} and j_{corr} measurements.

Keywords: Sodium Phosphate; Pre-treatment of rebars; Corrosion current density; EIS; Mortar.