

Empirical modelling of indicators of chloride-induced rebar corrosion

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Abstract:

The present investigation has been aimed at to carry out the modelling of the indicators of chloride-induced corrosion of the rebar in concrete under normal exposure at early age. The main factors considered are w/c ratio, cement content and the chloride content of concrete. In order to evaluate the simultaneous effects of these factors on rebar corrosion in terms of corrosion indicators such as a half-cell potential, concrete resistivity, corrosion rate, free Cl content and pH of concrete, a standard statistical experiment design has been adopted. Through analysis of variance (ANOVA), the factors and their possible interactions affecting each corrosion indicator have been identified. After identifying the effect of factors and their possible interactions on each of the corrosion indicators separately, the empirical models for corrosion indicators have been fitted in terms of the effective factors and interactions, using the method of least squares, and utility of these models is discussed.