Electrochemical Impedance Spectroscopy Study on Corrosion Inhibitor for Reinforced Concrete

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In this essay, electrochemical impedance spectroscopy (EIS) was applied to investigate the behavior of steel at diverse phases during corrosion. The evolution of obtained spectra manifested the start of partial corrosion of steel and the gradual inhibition with different concentrations of the inhibitor. Calcium nitrite was found to have the capacity to inhibit the steel corrosion, and the best inhibitor efficiency was investigated for $[\text{Cl}^-]/[\text{NO}_2^-]$. If the value of this rate was attained in the initial phases of the corrosion course, the inhibition efficiency would be higher. Calcium nitrite has excellent effectiveness when used as a penetrating corrosion inhibitor for steel in concrete.

Keywords: Calcium nitrite; Electrochemical impedance spectroscopy; Corrosion inhibitor; Reinforced concrete; Penetration

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