Short Communication

Influence of Sodium Lignosulfonate on the Corrosion-Inhibition Behavior of Q235 Steel in Simulated Concrete Pore Solutions

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doi: 10.20964/2020.08.02

Received: 31 March 2020 / *Accepted:* 11 May 2020 / *Published:* 10 July 2020

The corrosion mechanism and behavior of Q235 steel treated with sodium lignosulfonate and a mixture of sodium lignosulfonate and sodium silicate inhibitors in simulated concrete pore (SCP) solutions containing 0.08-mol/L NaCl were evaluated using polarization methods, electrochemical impedance spectroscopy, scanning electron microscopy, weight-loss measurements, and potential-of-zero-charge analysis. Results verified that the inhibition efficiency rapidly increased as the sodium lignosulfonate content increases, and the adsorption process mainly comprised chemisorption. The optimum sodium lignosulfonate concentration was 0.0015 mol/L. Sodium lignosulfonate and sodium silicate showed a synergistic inhibition effect in SCP solutions, with the highest inhibition efficiency of 98.8% achieved when 0.0005-mol/L sodium lignosulfonate and 0.0005-mol/L sodium silicate were used.

Keywords: sodium lignosulfonate; sodium silicate; Q235 steel; corrosion inhibition; simulated concrete pore solution

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