Galvanic Corrosion Between AISI304 Stainless Steel and Carbon Steel in Chloride Contaminated Mortars

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Galvanic corrosion between AISI304 stainless steel and carbon steel in mortars has been studied by open circuit potential, electrochemical impedance spectroscopy, and galvanic coupling currents. The corrosion state of the coupling rebar was also examined after removing the mortars. The results suggest that the carbon steel presents a high risk of galvanic corrosion in the initial stage when it is electrically coupled with stainless steel in the chloride-contaminated mortars. However, for the stainless steel promotes the passivation of carbon steel, the risk of galvanic corrosion on carbon steel significantly decreased as the time extends. In addition, the water-cement ratio of mortars does not have a dramatic influence on the galvanic corrosion between stainless steel and carbon steel in the chloride-contaminated environment.

Keywords: Stainless steel, carbon steel, galvanic corrosion, concrete, electrochemical test.

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