Investigation of concrete crack repair by electrochemical deposition

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Cracks in reinforced concrete structures are inevitable in the process of use. Cracks not only affect the aesthetics of the structure appearance, but also affect the overall performance of the structure and shorten its life. Traditional methods are limited for repairing cracks in reinforced concrete in an aqueous environment. Electrochemical deposition is a relatively new method for repairing cracks in reinforced concrete, which fills and heals cracks in concrete, and increases the alkalinity of the surroundings of the reinforcing steel in concrete, slowing down the reinforcing steel corrosion caused by harmful substances. In this study, the changes in the surface coverage of the concrete specimens during the repair process were studied. Three different concentrations of electrolyte solutions were tested with three different intensities of electric current. The test results showed that the surface coverage of the concrete specimens was increasing during the repair process. The repair depths of the cracks on the specimens were measured by three different intensities of electric current to three different concentrations of electrolyte solutions at different times. The results showed that the repair rate of the crack depth of the specimens increased and then decreased with the increase of the current intensity. It can be concluded that the rate of crack repair increases with the current intensity and then decreases with the increase of electrolyte solution concentration.

Keywords: Crack repair; Electrochemical Deposition; Concrete; Mass change; Surface coverage

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