Electrochemical Corrosion Control for Reinforced Concrete Structures—A Review

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Electrochemical corrosion control (ECC), including cathodic protection (CP), electrochemical chlorine removal (ECR) and electrochemical realkalisation (ER), is extremely effective for improving the durability of reinforced concrete structures. This paper summarizes recent studies on ECC. The findings indicate that long-term ECC with an intermittent small current can achieve CP, ECR, and ER, making it an attractive approach. It is imperative to develop a numerical model of ECC that includes ionic transport in pore solution, oxygen and water transports, thermodynamic reactions, and electrode kinetics. Additionally, an intelligent system integrating corrosion monitoring and intermittent ECC will be beneficial.

Keywords: reinforced concrete structures; corrosion control; cathodic protection (CP); electrochemical chloride removal (ECR); electrochemical realkalisation (ER)

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