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Corrosion Monitoring Techniques Impact on Concrete Durability: A Review

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Abstract : Corrosion of reinforcement in concrete structures remains a durability issue in structural engineering with the increasing cost of repair and maintenance. The mechanism and factors influencing reinforcement corrosion in concrete with various electrochemical monitoring techniques including non-destructive, destructive techniques and the roles of sensors have been reviewed with the aim of determining the monitoring technique that proved most effective in determining corrosion parameters and more practicable for the assessment of concrete durability. Electrochemical impedance spectroscopy (EIS) and linear polarization resistance (LPR) techniques showed great performance in evaluating corrosion kinetics and corrosion rate, respectively, while the gravimetric weight loss (GWL) technique provided accurate measurements. However, no single monitoring technique showed to be the ultimate technique, and this calls for more research work in the development of more dynamic monitoring tools capable of considering all possible corrosion factors in the corrosion monitoring process.

Keywords : corrosion, concrete structures, durability, non-destructive technique, sensor
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