Study on the electrochemical corrosion and scale growth of ductile iron in water distribution system. PART II

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Long-term contact with carried water makes water supply pipes prone to electrochemical corrosion, which will lead to pipelines leaking or bursting. In this study, a flow corrosion simulation and monitoring system (FCSMS) was designed to systematically study the factors influencing internal corrosion of ductile iron pipes. By using the linear polarization resistance (LPR) method, EIS and the polarization curve test, it was determined how five influencing factors (including temperature and pH) affect the corrosion rate, corrosion scale structure and anodic and cathodic reactions. Then, the effect mechanism of each influencing factor in the internal corrosion process was expounded, and the importance of the influencing factors was determined by correlation analysis: temperature> pH> dissolved oxygen> total hardness> total residual chlorine.

Keywords: water supply pipe, corrosion scale, influencing factors, EIS, polarization curve

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