A Statistical Study on Metastable Pitting of 304 Stainless Steel in Chloride Contaminated Carbonated Concrete Pore Solution

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Statistical characteristics of metastable pits on 304 stainless steel in chloride contaminated carbonated pore solution was investigated via potentiodynamic and potentiostatic polarization. The peak current, pit radius and stability product of metastable pits increased; the growth rate and repassivation rate were enhanced; and the metastable pits were easier to transform to stable pits when the concentration of chloride increased in the pore solution. Additionally, extreme value statistics and cumulative probability distribution on the parameters of metastable pits follow a semi-logarithmic linear distribution, and the former present a better fitting result.

Keywords: Statistical study; pitting corrosion; stainless steel; concrete; potentiostatic polarization.

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