A Simulation Study of the Direct Current Corrosion Characteristics of Carbon Steel Grounding Electrode with Ground Lead

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In this study, corrosion of the horizontal linear carbon steel grounding electrode buried in soil of the transmission system at various direct current (DC) densities was investigated by the electrode potential, pH, anode iron dissolution and corrosion rate. A simulation model of DC corrosion behavior was established. The corrosion micro-mechanism of grounding electrode under DC interference was analyzed. This study found that the stray current density has a positive correlation with electrode potential, anode iron dissolution and corrosion rate. The DC current will significantly accelerate the dissolution rate and corrosion rate of the steel. The DC density has a different influence on the soil pH around the grounding electrode.

Keywords: Grounding electrode; Corrosion; Stray current; Simulation

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