The Influence of Nickel on Corrosion Behavior of Low Alloy Steel in a Cyclic Wet-dry Condition

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The marine atmosphere corrosion behavior of a low alloy steel with different nickel contents (0, 0.8, 2, 5 wt%) was studied in the alternate wet-dry conditions(dry/wet conditions). The technique of polarization curves, EIS and SEM were used to study the effect of Ni on the corrosion resistance of four steels, which indicated that the addition of Ni shifted the corrosion potential of the steel in the positive direction and made the corrosion current density lower. The enhancement of the corrosion resistance of steel favored the formation of a homogeneous and compact inner rust layer, and the higher the content of nickel was in the steel, the faster the protective rust layer was generated.

Keywords: corrosion resistance, low alloy steel, cyclic wet-dry condition, nickel

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