Short Communication

Investigation of Metal Coated D32 Steel Corrosion in Marine Environment

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To explore a metal coating suitable for metal corrosion protection in ocean low-salinity dry-wet cycle environment, taking the corrosion environment with low salinity in Bohai Sea area as the research object, the corrosion behavior and pitting characteristic of D32 steel with different metal coatings (Al, Mg, Cu and Zn) with the thickness of $30 \pm 1 \mu\text{m}$ was studied through electrochemical test and corrosion morphology analysis, so as to determine the best protective metal coatings. The results showed that under the condition of 20 dry-wet cycles and low chloride ion concentration, the four samples were in activated conditions and anode controlled. The corrosion potential of four metal coatings was $\text{Cu} < \text{Zn} < \text{Al} < \text{Mg}$ -coated steel, the corrosion current density was $\text{Zn} < \text{Cu} < \text{Mg} < \text{Al}$ -coated steel, the general corrosion rate was $\text{Al} < \text{Cu} < \text{Zn} < \text{Mg}$ -coated steel, and the pitting corrosion rate was $\text{Mg} < \text{Zn} < \text{Cu} < \text{Al}$ -coated steel. Therefore, under the research conditions in this paper, Zn coating can be used to protect D32 steel in the ocean spray area with low salinity.

Keywords: Low salinity; Wet-dry cycle; Metal coating; D32 steel

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