Effect of Cu Alloying on Corrosion Behavior of X80 Steel in *Bacillus licheniformis* Environment

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Abstract Through refining five types of pipeline steel with different Cu contents (0Cu, 0.6Cu, 1.0Cu, 1.3Cu, 2.0Cu, w%), the effects of Cu content and aging treatment on the corrosion behavior of X80 steel in a Bacillus licheniformis environment were investigated from the perspectives of antibacterial performance, corrosion product analysis, and electrochemical behavior. The study revealed that only the 2.0Cu steel exhibited a notable antibacterial effect against Bacillus licheniformis. For rolled materials, the addition of Cu enhances corrosion resistance, but aging accelerates corrosion in Cu-containing steels. In bacterial systems, the corrosion current density of the material is lower compared to sterile systems, indicating that the microbial film offers some protective effect.

Keywords pipeline steel, Cu, nitrate reducing bacteria

Reference

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