Effects of Homoacetogenic Bacteria on the Corrosion Behaviour and Cathodic Protection of AISI 4135 Steel

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The corrosion behaviour of high-strength low-alloy AISI 4135 steel was studied in the presence of homoacetogenic bacteria (*Blautia coccooides* GA-1), which catalyse the formation of acetate from H₂ plus CO₂ in their energy metabolism. In addition, the effects of cathodic protection were studied. The chronoamperometry curves showed a negative current density. The minimum current density was approximately $-1.5 \mu\text{A}\cdot\text{cm}^{-2}$. The results revealed that the strain GA-1 could consume ‘cathodic hydrogen’ and promote the cathodic reaction of AISI 4135 steel, but the hydrogen consumption of strain GA-1 was not the main reason leading to the increase in the corrosion current density.

Keywords: High-strength low-alloy steel, Biocorrosion, Homoacetogenic, Cathodic protection

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