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Hydrophobic coatings for improving corrosion resistance of manganese substrate

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Abstract

Herein hydrophobic coatings on the surface of manganese were fabricated by immersing manganese substrate into passivation solution with stearic acid (SA) and stearic acid diethanolamide (SDEA). The novelty is that micelles of SDEA can help insoluble SA largely dissolve in solution, then SA and SDEA form hydrophobic passivation coatings simultaneously to greatly improve corrosion resistance of manganese substrate. The characteristics of passivation coatings (corrosion resistance, surface wettability, surface morphology, density and roughness) and passivation solution (stability, particle size and viscosity) were discussed in detail. The formation mechanism of hydrophobic coatings was explained by the results of FT-IR, XPS and Gaussian simulation. After passivation, the corrosion potential of manganese was

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