Influence of Mn on the Corrosion Behaviour of Medium Manganese Steels in a Simulated Seawater Environment

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The influence of Mn on the corrosion behaviour of medium manganese steels was studied by employing a laboratory accelerated corrosion test that involved cyclic wet/dry conditions in a simulated seawater environment. At different time points during the cyclic corrosion tests, the character of the rust film and the susceptibility of the tested medium manganese steels to corrosion were examined using SEM, XRD, and EPMA as well as analysis of the potential-pH diagram. The medium manganese steels exhibited lower corrosion resistance due to the enrichment of MnFe₂O₄ in the rust films. Moreover, the effect of small amounts of alloying Mo and Ni elements on medium manganese steels was discussed.

Keywords: medium manganese steel; weight loss; SEM; Pourbaix diagram; rust

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