

CORROSION BEHAVIOR OF MILD STEEL IN A SIMULATED AQUEOUS SOLUTION AFTER TREATMENT BY SEVERAL INHIBITORS

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The weather in the Arabian Gulf region is hot and humid providing corrosive environment for mild steel. The atmospheric corrosion in the Gulf region is aggravated further by high salinity of Gulf water resulting in the high rate of sea-salt deposition. In addition, sulfur dioxide and organic carbonaceous deposits from burning fuel make the atmosphere in the Gulf region more corrosive. Various inhibitors were reported in the literature that can help in protection against metal corrosion in aqueous environments. Among them ten inhibitors (calcium silicate, cyclohexylamine, n-methylcyclohexylamine, dicyclohexylamine nitrite, sodium dihydrogen orthophosphate, sodium benzoate, sodium nitrate, sodium nitrite, sodium phosphate, and magnesium nitrate hexahydrate) were obtained and corrosion resistance of inhibitor applied steel specimens were examined in a simulated

solution of 2 wt% NaCl and 1 wt% Na₂SO₄.

Test specimens were prepared from locally produced reinforcing steel products.

Treatment of steel with 10 mM dicyclohexylamine nitrite for 1 day at room temperature resulted in the best inhibition of corrosion. No significant improvement in corrosion inhibition was observed either with an increase in inhibitor concentration at room temperature or with an increase in inhibitor application temperature at 10 mM concentration. A further study is planned to examine the inhibition performance of dicyclohexylamine nitrite under actual atmospheric conditions.