

Influence of N-Heterocyclic Compounds on the Corrosion of Al-Si Alloy in Hydrochloric Acid -Effect of pH and Temperature

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ABSTRACT

Two N-heterocyclic compounds were tested as inhibitors for the corrosion of an Al-11% Si alloy in hydrochloric acid (HCl) solutions by polarization and chemical measurements. Results indicated that Compound (B), containing a quinolinium moiety, was more effective than Compound (A), which contained a pyridinium moiety. Acceleration of corrosion by Compound (B) was observed to occur at low concentrations of the compound and also in alkaline media. An increase in HCl concentration caused a decrease in the inhibition efficiency. The abrupt decrease in inhibition by Compound (B) at temperatures exceeding 50°C was attributed to reorientation of the molecules at higher temperatures. Values of the apparent activation energies of adsorption support the conclusion that Compound (B) was more efficient than Compound (A) in inhibiting the corrosion of the alloy.

KEY WORDS: *acceleration, Al-Si alloy, hydrochloric acid, inhibition, N-heterocyclic compounds, polarization*