

Inhibition Effect of Aminophen Fluid Derivative on the Corrosion of 1070 Aluminum

Abstract:

The corrosion mitigation effect of aminophen (an organic fluid derivative) on 1070 aluminum alloy was studied in 1 M HCl solution by potentiodynamic polarization and weight loss analysis. Data obtained showed aminophen performed poorly at low concentrations (2.5%, 5% and 7.5%) with optimal value of 49.9% and 30% (potentiodynamic polarization and weight loss analysis) at 7.5% aminophen concentration. At 10% concentration, significant improvement in inhibition efficiency value was observed (53% and 61.33%), but the value is below the threshold minimum for effective inhibition. Effective inhibition efficiency occurred at 12.5% and 15% aminophen concentration with values of 71% and 81.67% at 12.5% concentration, and 89% and 70.77% at 15% concentration. Plots from weight loss indicated stable thermodynamic behavior throughout the exposure hours. Aminophen demonstrated anodic-cathodic type inhibition characteristics with dominant cathodic inhibition action. Corrosion inhibition behavior of aminophen aligned with Frumkin and Freundlich adsorption isotherm models. However, thermodynamic calculations show adsorption did not occur. Inhibition behavior of aminophen on 1070 aluminum occurred through modification of the corrosive media.