

*The isoxazolidines: the effects of steric factor and hydrophobic chain length
on the corrosion inhibition of mild steel in acidic medium*

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ABSTRACT

Several new isoxazolidines having varying degree of steric environment and hydrophobic chain length, prepd. efficiently using single-step nitrene cycloaddn. reactions, are tested for corrosion inhibition of mild steel in 1 M and 5 M HCl at 50-70 °C range by gravimetric and electrochem. methods. All compds. have shown very good corrosion inhibition efficiency (IE%) in acidic soln. Steric crowding around the nitrogen centers and hydrophobic chain lengths as well as increase in temp. (in the presence of the inhibitor in the higher concn. range 100-400 ppm) are found to increase the inhibition efficiency of the isoxazolidines. Thermodyn. parameters (ΔG° ads, ΔH° ads, ΔS° ads) for the adsorption process and kinetic parameters for the metal dissoln. (or hydrogen evolution) reaction in the presence of one of the isoxazolidines were detd. Exptl. results agree with the Temkin adsorption isotherm. The inhibition of corrosion in 1 M HCl, influenced by both physi- and chemi-sorption, was found to be under mixed control, but predominantly under cathodic control.