Synergistic inhibition effect of Diantipyrylmethane and Potassium thiocyanate on mild steel corrosion in 1 M HCl solution

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The inhibition effect of Diantipyrylmethane (DAM) and its synergistic effect with potassium thiocyanate (KSCN) on mild steel corrosion in 1 M HCl solution were investigated by electrochemical methods, gravimetric analysis and scanning electron microscopy (SEM). The experiment results show that the inhibition efficiency increases with the concentration of DAM alone and increases further with the presence of 2 mM KSCN. The synergism parameters demonstrate that DAM cation has a significant synergistic effect with thiocyanate anion, which is agree with the corresponding thermodynamic and kinetic parameters. The results of quantum chemical calculation confirm that the dication structure of DAM molecule in acid medium plays a vital role during corrosion inhibition of mild steel.

Keywords: Diantipyrylmethane, Potassium thiocyanate, Synergism, Steel corrosion

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