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SYNERGISM AND ANTAGONISM IN IRON BASE METALLIC GLASS CORROSION INHIBITION BY THIOSEMICARBAZONE COMPOUNDS AND BROMIDE IONS

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The synergistic and antagonism action caused by Br ions on the corrosion inhibition of $Fc_{78}B_{13}Si_9$ glassy alloy in 0.2 M Na_2SO_4 in absence and presence 10^{-4} M of some thiosemicarbazone derivatives have been investigated using potentiodynamic polarization, a.c. impedance techniques and morphological study. Results show that the addition of Br ions to sulphate solution inhibit the corrosion process by acting as an electron transfer barrier due to direct adsorption of these ions on alloy surface. A synergistic effect exists when fixed concentration of studied thiosemicarbazone derivatives and low concentrations of Br ions are used together to prevent glassy alloy corrosion in Na_2SO_4. The increase in surface coverage values in the presence at low concentrations of Br ions indicates that an insoluble complex formed by undergoing joint adsorption. The synergism parameter (S_θ) is defined and calculated by surface coverage values. The parameter in the case of small amount of Br found to be more than unity, indicating that the enhanced inhibition efficiency caused by the addition of Br ions is only due to synergism and there is a definite contribution from the inhibitor molecule.

Keywords: Iron-base metallic glasses, thioscmicarbazones, corrosion inhibition, bromide ion, electrochemical methods, synergism and antagonism.