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Synergistic Effect of Azadirachta Indica Extract and Iodide Ions on the Corrosion Inhibition of Aluminium in Acid Media

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ABSTRACT. *The synergistic action caused by iodide ions on the corrosion inhibition of aluminum (Al) in 0.5 M HCl in the presence of* ***Azadirachta Indica (AZI)*** *plant extract has been investigated using potintiodynamic polarization and impedance techniques. It is found that* ***AZI*** *extract inhibits the corrosion of aluminum in 0.5 M HCl. The inhibition efficiency increases with the increase in* ***AZI*** *extract concentration, until 24% v/v of* ***AZI*** *extract, and then Inh.% is decreased with father increase in* ***AZI*** *extract concentration. The adsorption of this extract in the studied concentration is found to obey Frewendlish adsorption isotherm. The addition of iodide ions enhances the inhibition efficiency to a considerable extent. The increase in Inh.% values in presence of fixed concentration of iodide ions indicates that* ***AZI*** *extract forms an insoluble complex at lower* ***AZI*** *extract concentrations by undergoing a joint adsorption. But at higher concentrations of AZI extract, competitive adsorption is found between iodide ions and the formed complex leading to less Inh.%. The Inh.% decreased in presence of iodide ions with* ***AZI*** *extract than in presence of* ***AZI*** *extract alone at all studied iodide concentrations. The synergism parameter* S_θ *is defined and calculated from surface coverage values. This parameter in the case of* ***AZI*** *extract is found to be more than unity, indicating that the enhanced inhibition efficiency caused by the addition of iodide ions.*

Keywords: Iodide ions, Azadirachta Indica, Corrosion inhibition