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# **Pullulan as a Potent Green Inhibitor for Corrosion Mitigation of Aluminum composite: Electrochemical and Surface Studies**

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## **Abstract**

This work emphasizes the corrosion inhibition ability of pullulan, an environmentally benign fungal polysaccharide on acid corrosion of 6061Aluminum-15%<sub>(v)</sub> SiC<sub>(p)</sub> composite material (Al-CM). The electrochemical measurements such as potentiodynamic polarization (PDP) and electrochemical impedance spectroscopy (EIS) studies were carried out for the corrosion inhibition studies. Conditions were optimized to obtain maximum inhibition efficiency, by performing the experiment at varying concentrations of inhibitor, in the temperature range of 308 K- 323 K. Surface morphology studies were done to reaffirm the adsorption of inhibitor on the surface of composite material. Pullulan acted as mixed type of inhibitor with a maximum efficiency of 89% at 303K for the addition of 1.0 gL<sup>-1</sup> of inhibitor. Evaluation of kinetic and thermodynamic parameters revealed that inhibitor underwent physical adsorption onto the surface of Al-CM and obeyed Freundlich adsorption isotherm. The surface characterization like SEM-EDX, AFM confirmed the adsorption of pullulan molecule. Pullulan can be considered as effective, eco friendly green inhibitor for the corrosion control of Al-CM.

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