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# **Chitosan: A macromolecule as green Corrosion Inhibitor for mild steel in sulfamic acid useful for sugar industry**

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## **Abstract**

The present investigation aims at investigation of low cost nontoxic carbohydrate biopolymer chitosan as corrosion inhibitor alone and in combination with KI for mild steel in 1 M sulfamic acid medium using gravimetric, electrochemical and surface analysis techniques. It is found that chitosan alone exhibits inhibition efficiency of 73.8% at 200 ppm concentration. However, in combination with KI (5ppm), it gave more than 90% inhibition efficiency. The significant increase in the inhibition performance of chitosan has been explained by the synergistic mechanism. The results of Potentiodynamic polarization study shows that chitosan and its blend with KI decreases both anodic and cathodic reactions occurring at mild steel surface in 1 M sulfamic acid medium by blocking active sites of the metal and acts as mixed type inhibitor. EIS study reveals that the polarization resistance increases with increase in the concentration of inhibitors which increases charge transfer resistance across the metal/solution interface. The adsorption of chitosan followed

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