Corrosion by Polyaniline/Salicylaldehyde Modified Chitosan in Hydrochloric Acid Solution

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A new type of natural polymer corrosion inhibitor, polyaniline/salicylaldehyde modified chitosan, was synthesized by an innovative method. The inhibition efficiency of polyaniline/salicylaldehyde modified chitosan was evaluated by electrochemical techniques. Surface analysis using SEM characterization were carried out to understand the corrosion inhibition property. Quantum chemical descriptors were investigated to explain the performance of polyaniline/salicylaldehyde modified chitosan as corrosion inhibitor. Experimental results show that the polyaniline/salicylaldehyde modified chitosan had better acid resistance. The quantum chemical study gives insight into the benefits of the corrosion mechanism of polyaniline/salicylaldehyde modified chitosan. It is envisioned that the inhibitor can be used to tailor the properties of the corrosion system for specific applications, resulting in more reliable and durable metal protection in the future.

Keywords: Chitosan; Polyaniline; Corrosion; Inhibition; Quantum chemical

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