Short Communication

Inhibition Behavior of Chitooligosaccharide Derivatives for Carbon Steel in 3.5% NaCl Solution

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Chitooligosaccharide derivatives with different carboxymethylation degrees and grafting degrees of Schiff base were synthesized. Their inhibition property for carbon steel in 3.5% NaCl was tested by weight loss measurement, electrochemical measurements. The corrosion morphology of the specimens was examined by scanning electron microscope (SEM). The inhibition mechanism was analyzed by adsorption isotherm fitting and quantum chemical calculation. The results indicated that carboxymethylation improved the inhibition effect by increasing the compounds' solubility; while grafting of Schiff base increased the amount of effective active groups directly but had bad effect on the solubility. The molecules adsorbed on the carbon steel surface by physisorption and chemisorption according to Temkin adsorption isotherm and acted as a mixed type inhibitor.

Keywords: Chitooligosaccharide, carboxymethylation, grafting degree, electrochemical measurements, Temkin adsorption

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