Poly-levodopa as an Eco-friendly Corrosion Inhibitor for Q235 Steel

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The corrosion inhibition effect of polylevodopa (poly-(L-DOPA)) on Q235 carbon steel in 1 M HCl was studied owing to its low cytotoxicity and special structure. Electrochemical measurements show that the corrosion inhibition efficiency increases with the increase of poly-(L-DOPA) concentration and the immersion time. When the concentration of poly-(L-DOPA) is 300 mg/L, the corrosion inhibition efficiency can reach 97%. Confocal laser scanning microscopy (CLSM) and field emission scanning electron microscope (FESEM) proved that poly-(L-DOPA) has a good corrosion inhibition effect on Q235 carbon steel immersed in 1 M HCl. Poly-(L-DOPA) adsorbs on the surface of Q235 carbon steel to form a protective film, and followed the Langmuir adsorption isotherm.

Keywords: Poly-(L-DOPA); Q235 Steel; Corrosion inhibition; Hydrochloric acid solution

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