The Inhibition Effect and Mechanism of 4H-1,2,4-triazol-3-amine and Three Schiff Bases Self-Assembled Films on the Corrosion of Carbon Steel

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4H-1,2,4-triazol-3-amine and itsaldehyde Schiff bases self-assembled films were formed on carbon steel surface. Electrochemical impedance spectroscopy and polarization curves measurements showed that the self-assembled films could protect carbon steel from corrosion in 0.5M HCl solution. X-ray photoelectron spectroscopy (XPS) analyses indicated that the chemisorption of triazol-3-ylamine and three Schiff bases molecules on carbon steel surface through N atom and ring. Quantum chemical calculation and dynamic simulation were used to further investigate the inhibition mechanism.

Keywords: Schiff base; self-assembled films; carbon steel; EIS; XPS.

FULL TEXT

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