Synthesis, Crystal Structure and Corrosion Inhibition Effect of S-benzyl-O,O'-bis(*p*-tert-butyl phenyl)dithiophosphate for Q235 Steel in 1.0 M HCl

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The new corrosion inhibitor of S-benzyl-O,O'-bis(*p*-tert-butyl phenyl)dithiophosphate (SOBP) was synthesized and characterized by elemental analysis, FT-IR, ¹H NMR, ¹³C NMR, ³¹P NMR and single crystal X-ray diffraction. Meanwhile, the corrosion inhibition and mechanism of SOBP for Q235 steel in 1.0 M HCl were studied by weight loss and potentiodynamic polarization measurement, also the crystal structure of corrosion inhibitor was presented. The potentiodynamic polarization measurement result indicates that SOBP is a mixed-type inhibitor. The two methods all reveal that the inhibition efficiency increases with the concentration of SOBP, which is an effective corrosion inhibitor. The adsorption of SOBP on Q235 steel surface in 1.0 M HCl belongs both physisorption and chemisorption.

Keywords: Synthesis; Structure; Corrosion; Steel; Hydrochloric acid.

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