Adsorption and Corrosion Inhibition Performance of 2-(*p*-bromobenzylthio)-1*H*-benzimidazole for Q235 Steel in HCl Solution

Chuan Lai^{1,2}, Hongxia Yang², Xiaogang Guo³, Xiulan Su¹, Lvshan Zhou¹, Lei Zhang¹, Bin Xie^{2,*}

¹ School of Chemistry and Chemical Engineering, Sichuan University of Arts and Science, Dazhou 635000, PR China

² Institute of Functional Materials, School of Chemical and Environmental Engineering, Material Corrosion and Protection Key Laboratory of Sichuan Province, Sichuan University of Science and Engineering, Zigong 643000, PR China

³ College of Chemistry and Chemical Engineering, Chongqing University, Chongqing 400044, PR China

*E-mail: xiebinsuse@163.com

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The new organic corrosion inhibitor of 2-(*p*-bromobenzylthio)-1*H*-benzimidazole (Br-BBD) was synthesized in this work. After prepared, the adsorption and corrosion inhibition performance of Br-BBD for Q235 steel in HCl solution were studied using EIS, SEM, polarization measurement and WLM (weight loss measurement). The results exhibit that Br-BBD acts as an excellent corrosion inhibitor for Q235 steel in HCl solution, and the inhibition efficiency can reach up to 98.07% when the Br-BBD concentration is 50 mg L⁻¹ in 1.0 M HCl at 25°C. In addition, the adsorption of the mixed-type inhibitor of Br-BBD on Q235 steel surface obey Langmuir adsorption isotherm, which is governed by spontaneous chemisorption mechanism.

Keywords: Adsorption; Corrosion inhibitor; Q235 steel; 2-mercaptobenzimidazole.

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