Short Communication

Castor-Bean Extract as an Inhibitor for Low Carbon Steel Corrosion in Simulated Oilfield Produced Water

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doi: 10.20964/2021.08.24

Received: 4 March 2021 / Accepted: 4 June 2021 / Published: 30 June 2021

Here, a green extraction of castor-bean (GECB) as an inhibitor was used for anti-corrosion enhancement of low carbon steel plates in simulated oilfield produced water (SOPW). The analysis was performed by electrochemical impedance spectroscopy (EIS), polarization and scanning electron microscopy evaluation. The EIS analysis indicated that the charge-transfer resistance values were considerably increased as the concentration of GECB inhibitor increased in the SOPW which exhibited that the existence of GECB caused to improve the corrosion resistance of low carbon steel plate. The polarization assessment reveals that the GECB addition increased the corrosion resistant performance in low carbon steel plates noticeably with the formation of protective passive film. FESEM images of the samples indicate that the corrosion pits formed on the steel surface were reduced when GECB was added to SOPW, which is compatible with obtained electrochemical results. These results revealed that extraction of the castor-beans acted as a proper corrosion inhibitor and had a main participation in the inhibition process since it indicated 72% of inhibitor efficiency for 100 mg/L.

Keywords: Green extraction of castor-bean; Corrosion inhibitor; simulated oilfield produced water; Electrochemical evaluation

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