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Study of the iron behavior in acid rain water solution by application of two green corrosion inhibitors

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Abstract: Corrosion of iron in acidic medium similar to the acid rain water (pH=3.6) at various rotation speeds was investigated. Investigation included inhibiting effect of two new green formulations containing oils extracted from the seeds of Jatropha curcas (labeled JAC) and Aleurite moluccana (labeled ALM). The inhibition efficiency was evaluated by electrochemical measurements, after performing the automatic ohmic drop compensation (ZIR). The results obtained shows that the increase of the rotation speed, leads an increase of the current density (from 75.57µA/cm² at 0 rpm to 99.09 µA/cm² at1500 rpm). This increase can be explained by the increase in the amount of dissolved oxygen at the electrode surface in the acidic rain solution (pH=3.6). Also, the two environment-friendly corrosion inhibitors act as mixed type inhibitors that protected iron against the corrosion in the acidic solution. The inhibition efficiency increases with an increase of the inhibitor concentration to attain a maximum of 97% and 96% at 250 ppm of the ALM and the JAC respectively.

Keywords: Iron; acid rain water; corrosion; greens inhibitors; Jatropha curcas and Aleurites moluccana.