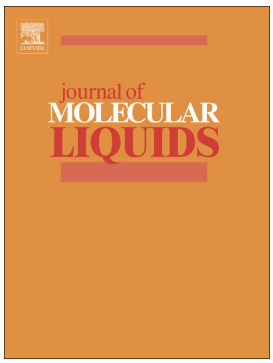

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Synthesis, characterization and corrosion inhibition studies of N-Phenyl-benzamides on the acidic corrosion of mild steel: Experimental and computational studies

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Abstract:

Present study aims to demonstrate the effect of electron withdrawing nitro (-NO_2) and electron releasing methoxy (-OCH_3) substituents on the inhibition behavior of N-Phenyl-benzamide derivatives (BNAs), namely N-(4-nitrophenyl) benzamide (BNA-1; -NO_2), N-phenylbenzamide (BNA-2; -H) and N-(4-methoxyphenyl)benzamide (BNA-3; -OCH_3) for mild steel acidic (1M HCl) corrosion. Results of the computational and experimental studies showed that methoxy (-OCH_3) substituent enhances the inhibition efficiency whereas nitro (-NO_2) decreases the inhibition efficiency. Electrochemical impedance spectroscope (EIS) study showed that BNAs acted as interface corrosion inhibitors and polarization study shows they acted as cathodic type corrosion inhibitors. They showed maximum efficiencies of 89.56%, 93.91% and 96.52% for BNA-1, BNA-2 and BNA-3, respectively. The BNAs strongly (high K_{ads} values) and