Corrosion Inhibitive Performance of the Waste Orange Peels (*Citrus Sinensis*) on A36 Mild Steel in 1M HCl

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This research work was carried out to investigate the corrosion inhibitive performance of the extract obtained from waste peels of orange (*citrus sinensis*) on A36 mild steel in HCl medium. A36 mild steel metal coupons were immersed in dilute hydrochloric acid solution (1M) containing different concentrations of the waste orange peels extract inhibitor (0 – 4 g/L) at different temperatures of 32⁰C & 45⁰C (during gravimetric tests), as well as 27⁰C & 50⁰C (during potentiodynamic tests). The gravimetric analysis performed revealed the highest inhibition efficiency of the extract to be 94.33% at concentration of 4 g/L and temperature of 32⁰C. Also, results from this analysis revealed a spontaneous (irreversible) and physisorption mode of adsorption of the inhibitor molecules as well as the fitness of the Langmuir adsorption isotherm for the adsorption process. The phytochemical analysis carried out revealed the presence of tannins, saponins, flavonoids, terpenoids and steriods in the inhibitor. The results of the potentiodynamic polarization analysis showed that the inhibitor retarded the anodic dissolution of mild steel more than the cathodic reaction which causes hydrogen evolution via the discharge of hydrogen ions.

Keywords: Corrosion; HCl; Inhibitor; Mild steel; Waste orange peels.

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