

Inhibition Efficiency of *Moringa Oleifera* Leaf Extract on the Corrosion of Reinforced Steel Bar in HCl Solution

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Abstract: *The inhibiting effect of Moringa Oleifera leaf extract on the corrosion of a reinforced steel bar in 2M solution of hydrogen chloride (HCl) was studied using gravimetric, gasometric and potentiodynamic polarization techniques. The study revealed that as the concentration of the extract increases, the inhibition efficiency increases in all three investigation scenarios. 1.0 g/l attained the efficiency of 92.31 % after 120 hours exposure during gravimetric measurement. The volume of the hydrogen gas evolved reduces with an increase in the exposure time during the gasometric test. It was noted that the extract slowed down the corrosion rate and the rate at which the hydrogen gas evolved. The formation of an adsorption layer on the surface of the metal reduces the rate at which hydrogen gas is evolved, which is a function of the concentration of the extract. Potentiodynamic polarization results revealed that the Moringa Oleifera leaf extract modifies the mechanism of anodic dissolution and cathodic hydrogen evolution. It was also observed that the corrosion current density decreases with the increase in the concentration of the extract. This decrease in corrosion is due to increased blocking of the metal surface by adsorption of the leaf extract. From the results, it can be concluded that Moringa Oleifera leaf extract can be used as a green inhibitor to slow corrosion of metals in aggressive media.*

Keywords: *Moringa Oleifera leaves, corrosion rate, weight loss, hydrogen evolution, potentiodynamic polarization*