Effect Of Dissolved CO_2 And *Syzygium Malaccense* Leaf DNA Concentrations On Carbon Steel Within A Carbonic Acid Equilibrium

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Abstract

The corrosion of CO_2 is a multifaceted process. This study investigated the impact of *Syzygium malaccense* DNA in combating the corrosion of dissolved CO_2 in water on mild steel. The increase in the concentration of CO_2 and of course the carbonic acid increases the corrosion rate of mild steel by speeding up the cathodic reaction. However, with regards to inhibitor efficiency, no evidence was found for a direct reaction of CO_2 on mild surface. The adsorption of *Syzygium malaccense* DNA inhibitor in all the concentrations of dissolved CO_2 media on mild steel surfaces obeyed the Freundlich adsorption isotherm as all linear correlation coefficient (R^2) values were close to 1. The inhibition mechanism was ascribed to the electrostatic interaction ensued amid the negatively charged surface of the mild steel and the positively charge DNA inhibitor molecule. All surfaces of tested samples were characterized by XRD and SEM. The 0 mg/L DNA in 1627 mg/L dissolved CO_2 led to formation of high rough surface. The XRD patterns depict that the mild steel mainly constitutes Fe and $FeCO_3$.