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Evaluation of the inhibitory action of essential oil from *Eucalyptus globulus* leaves on the corrosion of mild carbon steel in 1M HCl medium

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Abstract. The present work aims to valorize an aromatic and medicinal plant of *Eucalyptus globulus* found in the region of Dakar, Senegal. To do so, we first extracted the essential oil contained in the leaves of the plant harvested in October 2020. We obtained the essential oil by hydrodistillation using a Clevenger type extractor with a yield of 1.70% of the dry plant mass. This value is quite appreciable compared to the different values in the literature. The essential oil extracted from the leaves of *Eucalyptus globulus* was tested as a green inhibitor on carbon steel type XC38 in 1M HCl acid medium by the mass loss method. The results obtained led to a maximum inhibitory efficiency of 89.03% for a concentration of 1.6 g/L of essential oil at room temperature of 298 K. The effect of temperature on the inhibitory behavior of the essential oil was also studied over a range of 298 K to 338 K. In this temperature range, a loss of efficiency was observed with increasing temperature, reaching a value of 15.33% at 338 K. Thermodynamic quantities were then determined. The plot of the different isotherms showed that the adsorption of the essential oil obeys the Langmuir isotherm. The results obtained showed a physical character of adsorption of this essential oil.

***Keywords*:** essential oil; *Eucalyptus globulus*; inhibitor; corrosion; steel; mass loss measurement.

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