Effect of temperature on the corrosion inhibition on mild steel in 2.0M H_2SO_4 by some organic compounds containing *S* and *N* atoms in absence and presence of halides

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ABSTRACT

The corrosion rate of mild steel in 2.0M H_2SO_4 containing 10% EtOH in absence and presence 0.1M halides was studied by both hydrogen evolution and mass loss methods. The obtained results showed that the rate of corrosion was increased with the increase of temperature. The activation parameters for mild steel corrosion in 2.0M H_2SO_4 in absence and presence 0.1 M Cl^- & Br^- in the corrosive medium leads to a decrease in the ΔE_{app}, & $\Delta H^{\pm}$ and $\Delta S^{\pm}$ values than that of acid solutions which means that these ions becomes more effective as the temperature increases and corrosion inhibition is found . The studied compounds are found to accelerate the corrosion of mild steel at 20℃ then at 30℃ the inhibition of corrosion is increased then a decrease in the inhibition of corrosion or acceleration at 50 to 60℃ in compounds A, B and C is found, which indicates that these compounds are physically adsorbed on the mild steel surface and it also indicated that the inhibited film formed on the metal surface most probably destroyed with faster rates at high temperatures. Corrosion inhibition by studied compounds in presence 0.1M Cl^- or Br at different temperatures shows that corrosion of mild steel largely decreases with rising temperature this was explained to be that the halides are chemically adsorbed on steel surface and a co-adsorption of the studied compounds (A-C) is occurred.

Keywords: Corrosion inhibition, Mild steel, Sulphric acid, Action of halides, Effect of temperature**.**