

## Figures.

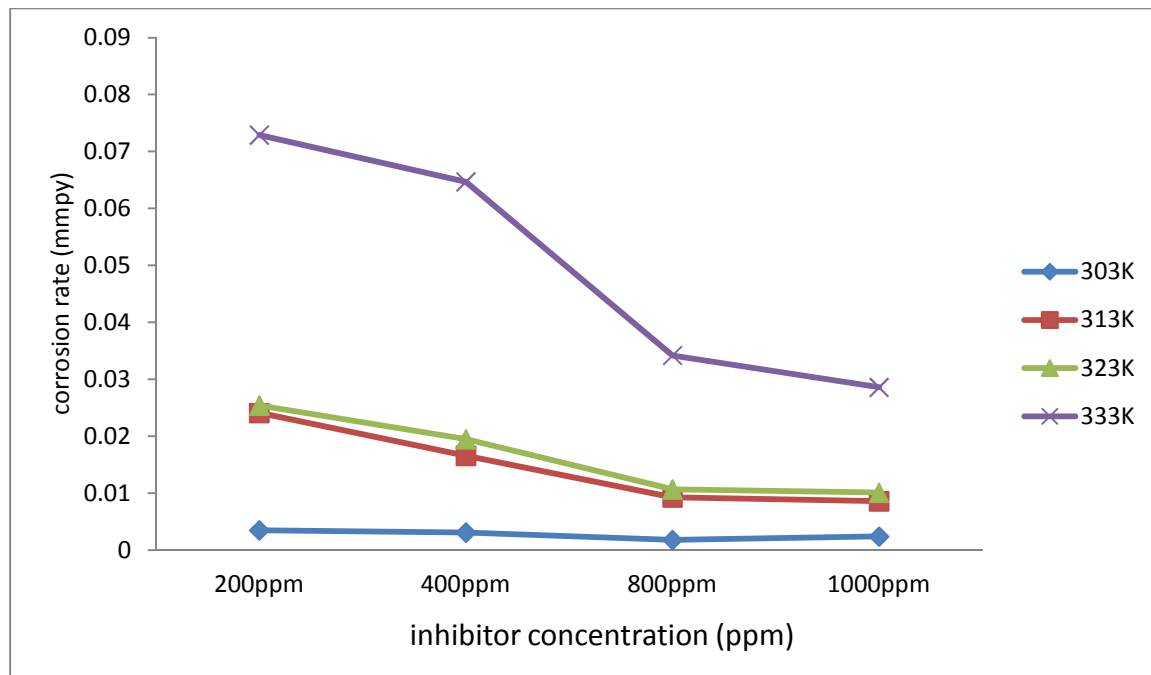


Fig. 1 . Plot between corrosion rate and inhibitor concentrations (200ppm, 400ppm, 800ppm and 1000ppm) at varying temperatures.

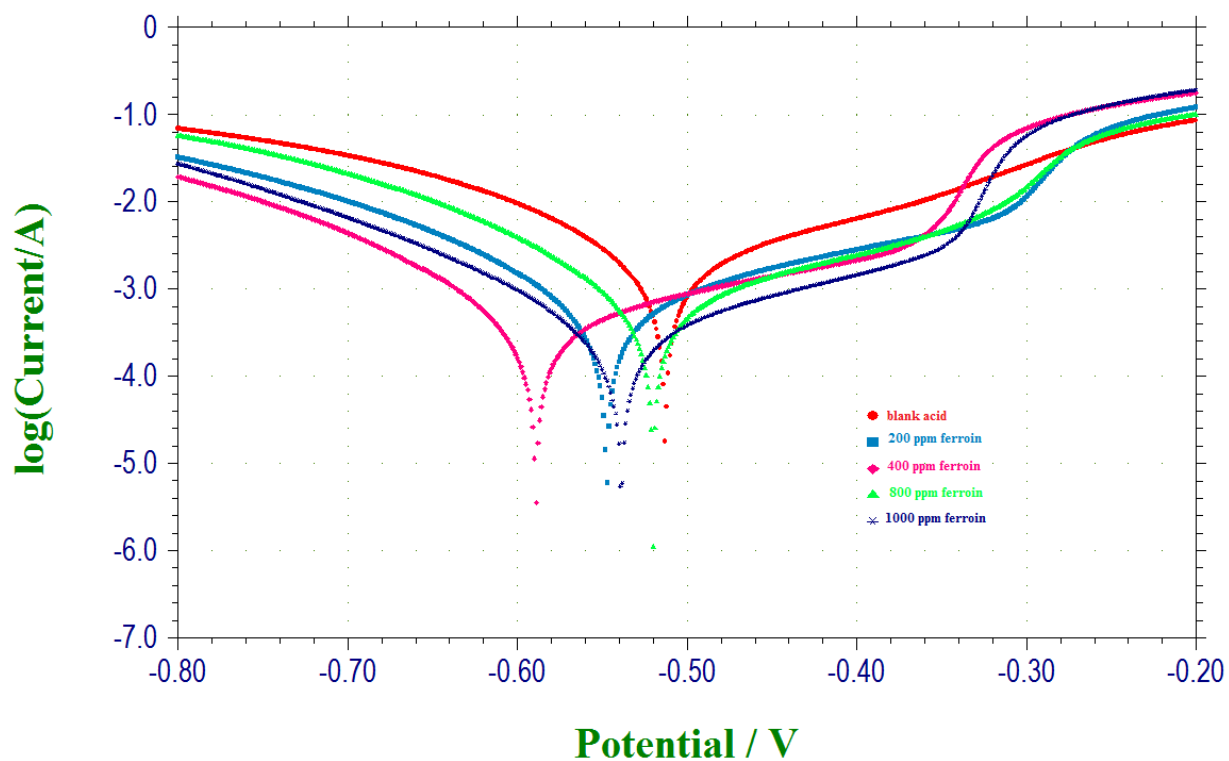


Fig. 2 Tafel curve at 303 K in absence and presence of Ferriin at 200ppm,400ppm,800ppm and 1000ppm concentrations.

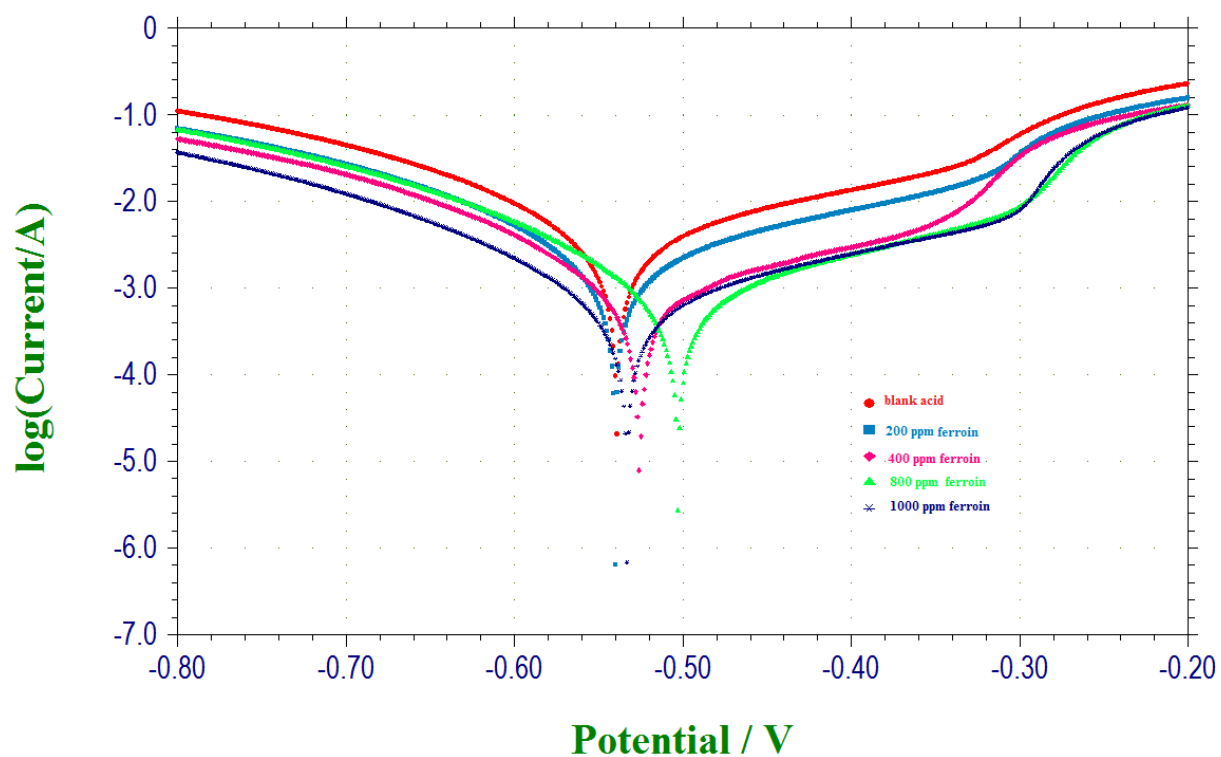


Fig. 3 Tafel curve at 313K in absence and presence of Ferriin at 200ppm,400ppm,800ppm and 1000ppm concentrations.

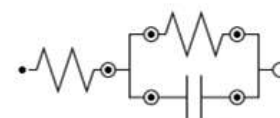
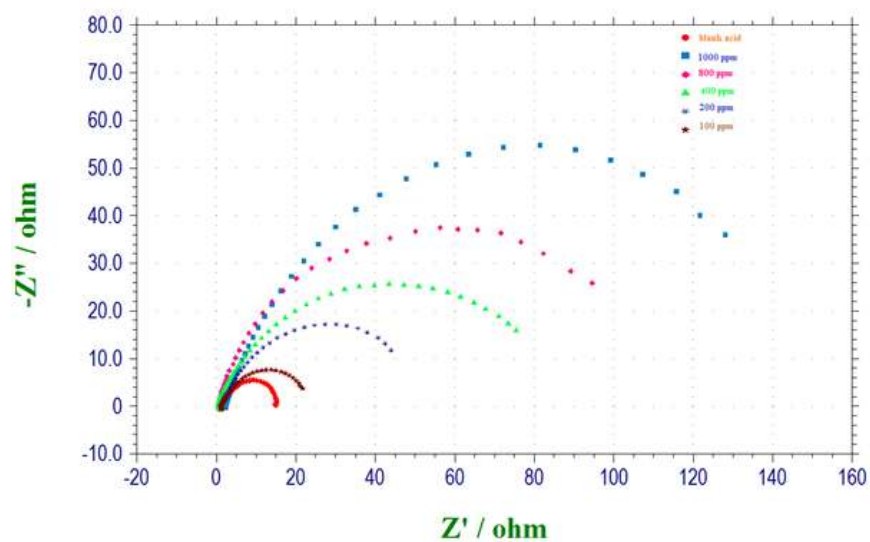


Fig.4(a) Nyquist plots in absence and presence of Ferroin in acidic medium at varying concentration, and  
(b) Equivalent circuit diagram of EIS study.

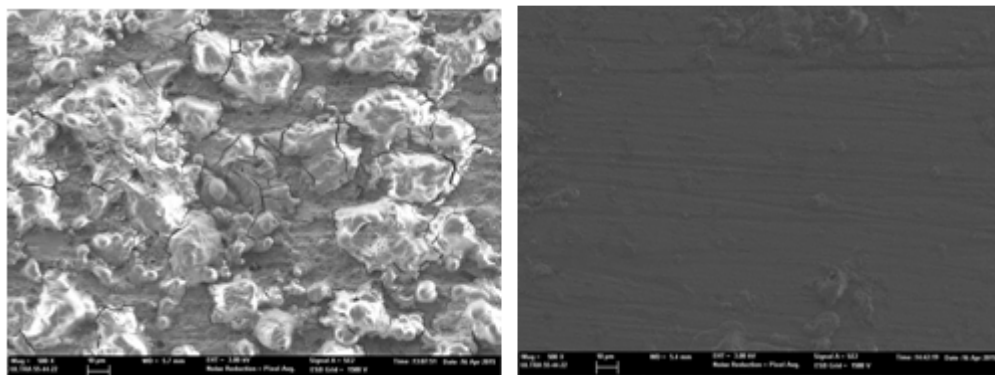


Fig.5(a) SEM images of MS surface in acidic medium in the absence of Ferroin at 303K , and

Fig. 5(b) SEM images of MS surface in acidic medium in the presence of Ferroin (1000ppm) at 303K.

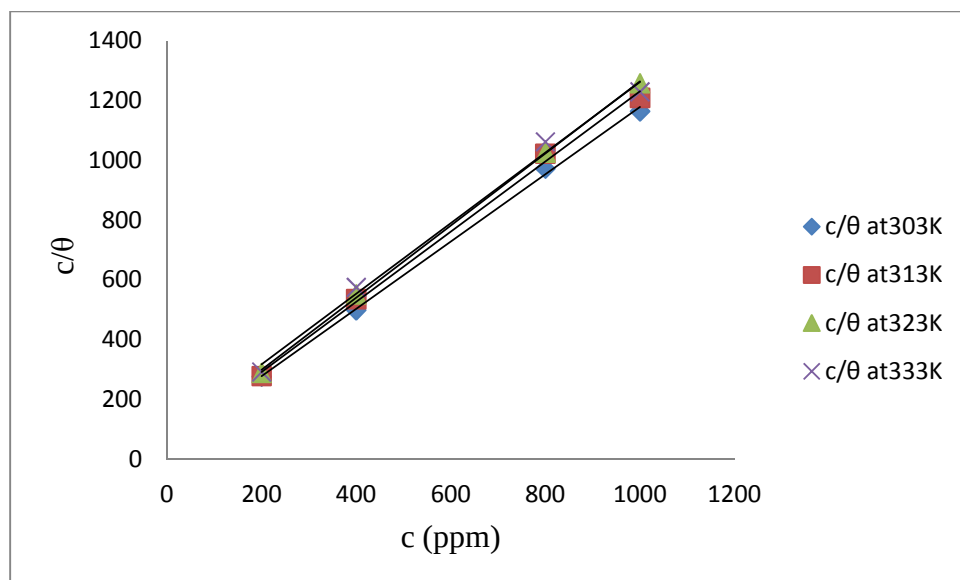


Fig.6 Langmuir isotherm for Ferriox solution at range of temperatures (303K,313K, 323K, 333K).

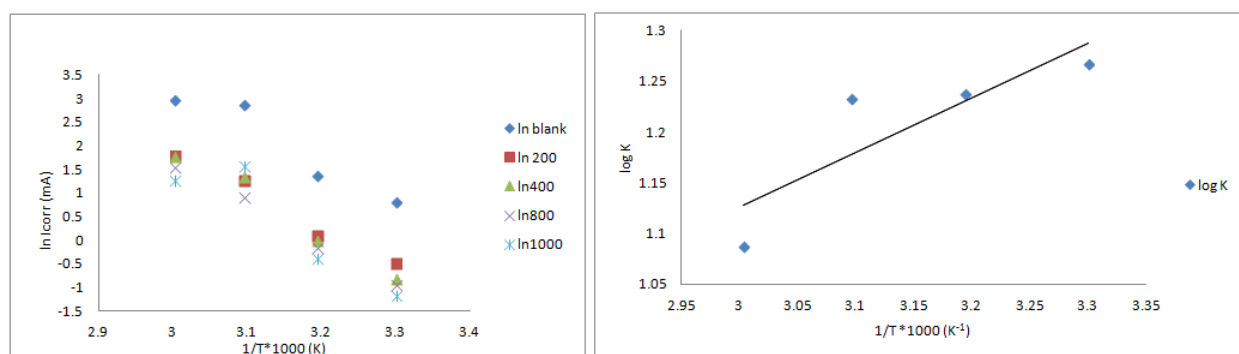
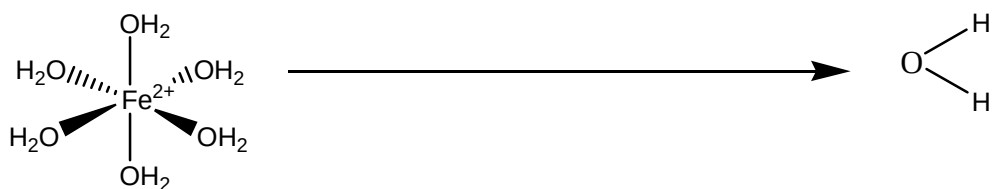


Fig. 7(a) Arrhenius plot of Ferriox solution at varing concentrations of inhibitor (200ppm, 400ppm, 800ppm, 1000ppm), and Fig. 7(b) Plot between log K and 1/T for slope (  $\Delta H^\circ$ ) and intercept (  $\Delta S^\circ$ ).



1<sup>st</sup> hydration shell

2<sup>nd</sup> hydration shell

Fig. 8 Hydration sheath of Fe ion replaced by the inhibitor during adsorption process.