CONCLUSION

The following conclusions have been drawn from the present research work.

1. Based on the literature survey, during the corrosion reaction the metal loses their useful properties. As a result, chemical or electrochemical reaction takes place with the environment.

2. Two natural inhibitors namely Piper nigrum.L and Adhatoda vasica and one organic inhibitor namely 1,2,3 Benzotriazole were successfully extracted and synthesized.

3. Piper nigrum.L (PNL), Adhatoda vasica (AV) and 1,2,3 Benzotriazole act as very good inhibitors in Hydrochloric, Sulphuric and Citric acid medium.

4. Corrosion rate decreased with increase in concentration of inhibitors and increased with increase in acid concentration (1M and 2M).

5. From the weight loss analysis it has been concluded that all the studied inhibitors effectively inhibit the corrosion of mild steel.

6. The maximum inhibiton efficiency of PNL, AV and 1,2,3 Benzotriazole was 80.28%, 74.36 and 68.96 respectively in 1M Sulphuric acid.

7. Out of these three inhibitors PNL acts as a best inhibitor in preventing the mild steel material in Sulphuric acid medium in 1M at 3hour duration (Inhibition Efficiency 80.28%).

8. The corrosion rate of mild steel in Sulphuric acid was higher than that of Hydrochloric and Citric acid because Sulphuric acid is a dibasic acid, so it stimulates a higher rate of corrosion in mild steel.
9. Weight loss data were also support to the electrochemical analysis like Open Circuit Potential, Potentiodynamic polarization and A.C.Impedance.

10. According to the results obtained from OCP due to the addition of the inhibitors molecules produces a positive shift in OCP since the corrosion potential was shifted to more nobler direction. Among the three inhibitors, PNL shows the highest inhibitive effect. The nobler shift of the OCP can be explained in terms of the formation of a protective layer of the inhibitor on the electrode surface.

11. From the A.C.Impedance study it has been revealed that the maximum inhibitor efficiency of PNL was 81.74 % in 1M Sulphuric acid at optimum concentration, whereas for AV it shows 70.49 % and for 1,2,3 Benzotriazole it was 62.02 % of inhibiton efficiency in 1M Sulphuric acid at optimum concentration.

12. According to the potentiodynamic polarization study the maximum inhibition efficiencies are shown in the following order PNL>AV> 1,2,3 Benzotriazole at their optimum concentration.

13. It has been revealed that all the inhibitors completely shield the metal surface by forming a fine protection layer and therefore effectively inhibit the corrosion of mild steel.

14. From the adsopion isotherm study, it obeys Langmuir adsorption isotherm for all the studied inhibitors.

15. The adsorption study results revealed that the nature of all the studied inhibitors show that the adsorption is of physisorption and no chemisorption occur between the inhibitor molecule and the metal surface.

16. The synthesized compounds were identified as very good inhibitors because of the presence of heteroatoms and unsaturated bond that cause effective adsorption
process leading to the formation of an insoluble protective surface film which suppresses the metal dissolution reaction.

17. FT-IR analysis confirms that the inhibition efficiency of the inhibitor in mild steel through electrostatic attraction of inhibitor molecule and the metal surface.

18. The morphological investigation also confirms the effective protection of mild steel, through the less damaged and minimum pits found in the inhibited surface.

19. This investigation gave an overview on material science in relation with physical and chemical science background and the nature of the metal have been studied. For further conclusion of corrosion rate the same work can be carried out in microorganism mediated corrosion.