PREFACE
Corrosion is a major problem on the materials due to usage of various chemicals and environmental effects in most of the industries and also on appliances used. This effect has a major effect on the nation’s economy. It seems that in India losses Rs 1.5 lakh crore due to corrosion. In United States and Japan alone spends $300b & $33b annually which states that it is 3.1% & 2% of the country’s GDP. for e.g, Most of the industries have cooling tower system which is made of wood, metals, plastic, fibreglass and the cool water is flown through mild steel, PVC, fiber glass or stainless steel piping to chillers, heat exchangers, vessels (mostly made of mild steel, stainless steel, copper). As mild steel is very cheap most of the industries prefer to use as a material in cooling tower which is leading to rapid corrosion. Hence there is a necessity to have a better control on corrosion and deposits by using good treatment system. Most of the metals can corrode followed by scaling in the system. There could different reasons why metals corrode so we should have full knowledge about metal and how corrosion can be defeated by using herbal inhibitors which is considered as one of the eco friendly technique instead of applying chemical inhibitors.

In 1999, a total of 70.7 million major home appliances and a total of 49.5 million comfort conditioning appliances were sold in the United States, for a total of 120.2 million appliances. The average consumer buying an appliance is only marginally interested in corrosion issues and during the useful life of the appliance; no corrosion management is done by consumers. For example, very few people realize that there is an anode in every water heater, and that this sacrificial bar of metals
should be checked and, if necessary, replaced with a new one, to prevent water heater failure due to internal corrosion. The life expectancy of appliances is determined from past experience and sales data. Improved corrosion design for appliances and usage of materials with inhibitor coatings (MS, SS) like geyser, water bath etc can increase their life expectancy.

Corrosion plays a vital role in degrading the materials which is leading to government costs. The increase in corrosion problems is seen in most of the industries and appliances. There are various technologies to defeat this problem like organic and inorganic coatings, molecular inhibitors, sol-gel coatings, high-energy coatings etc. In addition to this corrosion can also evaluated by using instrumental techniques like EIS, Polarization measurements, Scanning Electron Microscopy etc.

Many researches are working on mild steel corrosion by using herbal and chemical inhibitors and problems related to cooling tower water quality by giving chemical dosage to the tower. It was the aim of this issue which was taken up and attempt was made to contribute to the increasing interest in this field.

This theory not only focuses on the status of cooling tower and appliances (geyser and water bath) water quality physico-chemical parameters both in the absence and presence of inhibitors but also attempt was made to understand the effect of herbal inhibitors on mild steel to prevent corrosion. The attempt was successful and it was found that chemical parameters analysed meet to its standard permissible level when compared with SCA and SAWQG standards. The status of inhibition efficiency of herbal inhibitors was also investigated on mild steel in 1M HCl followed by cost benefit analysis. Hence this theory not only controls the cooling tower water quality parameters but also
gives a better herbal inhibitor than chemical inhibitor which will reduce corrosion on mild steel metal as mild steel is considered to be very cheapest metal and found to be used by most of the industries and in appliances. This technique can be applied by most of the industries which is cost-effective and eco-friendly.