

3. PROJECT DESCRIPTION

3.1. Abstract (Of the Original Research Proposal)

Corrosion is a costly problem that damages metal due to chemical reaction with the environment. In any industrialized nation its cost is greater than the financial cost of the floods, earthquakes, and severe natural disasters combined. Corrosion can lead to serious accidents, explosion and environmental damage. However the cost of corrosion can be drastically minimized by properly applying available technology.

To inhibit corrosion a novel class of compounds and polymers will be prepared from inexpensive starting material 1,12-dodecanediamine. Selective monoformylation followed by allylation of the free amine would give the N,N-diallyl-N'-formyl derivatives which will serve as precursors to the monomer molecules. The formylated amines upon quaternization with p-methoxybenzyl chloride, propargyl chloride and α,α' -dichloro-p-xylene would give the diallyl or tetraallyl quaternary monomers. The monomers on acid hydrolysis will give the free amine salts. The monomers will be subjected to polymerization (or copolymerization with sulfur dioxide) in presence of the initiator ammonium persulfate (or t-butylhydroperoxide) to give the polymers. The formyl group in these polymers will be removed by acid hydrolysis to afford the polymers with free as well as quaternary amine functionalities. The synthesized monomers and the polymers with multiple adsorption centres will be used to study the corrosion inhibition of mild steel. Outcome of this study should lead to better corrosion inhibitors that would have potential utilization in industry.