

## **Abstract**

In this dissertation, conditions were optimized to synthesize novel and more potent series of mixture of catalysts to synthesize lactic acid. The aim was green synthesis lactic acid in the optimum conditions and then scale up this process to increase the yield to fulfil the increasing demands of biodegradables in the country.

The purpose of the study is to prepare cheap and simple methods for the synthesis of lactic acid. Since it is a versatile chemical. This is the monomer of poly lactic acid which is an essential biodegradable plastic and highly demanded worldwide. This plastic is ecofriendly and will reduce the plastic pollution on earth.

In the first part, the series of certain metal ions and nano-particles were used to synthesize lactic acid by keeping the room temperature and pressure. The product formed was confirmed through the HPLC. The lactic acid formed was then further utilized to prepare the polymer. The lactide formation led to the synthesis of polymer.