

## SYNOPSIS

The dissertation entitled, "STUDIES IN CYCLOADDITION REACTIONS" has been divided into two chapters. The Chapter-I deals with a review on Diels-Alder reaction, conservation of molecular orbital symmetry, correlation diagram and FMO method, stereochemical modes of cycloaddition, regioselectivity in cycloaddition have been discussed in detail. Recent synthetic applications have also been discussed. The last part deals with enantioselective synthesis using Diels-Alder reaction.

The Chapter-II deals with the Diels-Alder reactions of sorbic acid and 1-acetoxy - 1, 3-butadiene with various dienophiles. Sorbic acid on reaction with maleic anhydride in dry benzene or toluene gave 6'-carboxy - 3 - methyl - 1, 2, 3, 6 - tetrahydro-phthalic anhydride. The structure of the product was assigned on the basis of I.R. and PMR data. The above product was dehydrogenated using DDQ. to give 3 - carboxy - 4 - methyl phthalic acid. The structure of which was assigned on the basis of IR and PMR spectral data. The reaction of sorbic acid with diethyl acetylene dicarboxylate to give 2, 3- dicarboethoxy- 4- methyl - 2, 5- cyclohexa- 2, 4 - diene-1- carboxylic

acid. The PMR and IR spectral characteristics were in agreement with the structure. The reaction of sorbic acid with methyl acrylate was investigated to give 2 - carbomethoxy - 4 - methyl- cyclohex-5- ene carboxylic acid. The PMR and IR spectral data conforms with the assigned structures.

1 - Acetoxy - 1, 3- butadiene serves as a good diene in Diels-Alder reactions. Its cycloaddition reaction with diethyl acetylene dicarboxylate yielded 2, 3- dicarboethoxy cyclohexa - 2, 5- diene - 1 - ol acetate. This product was hydrolysed with NaOH which on acidification gave phthalic acid. The reaction of benzoquinone with 1-acetoxy - 1, 3- butadiene gave hexahydronaphthalene - 5 $\alpha$ - ol-1, 4- dione acetate. The IR spectral data conforms with the assigned structure.