PREFACE

The organic chemistry of tellurium has been making great strides both in basic as well as applied research. The development of organic chemistry of tellurium has been catalysed by technical and biological interest in the field of organic synthesis, ligand chemistry, photoimaging agents, semiconductors, catalysis and radiopharmaceuticals for diagnostic purposes etc. A number of review and monographs exclusively on the uses of “Tellurium Reagents in Organic Synthesis” have been published in the literature. From an obscure branch of organic chemistry, organotellurium chemistry has emerged as a promising and advantageous alternative for some important synthetic operations. In view of this, it is proposed to investigate the applications of different types of inorganic and organic derivatives of tellurium such as aryltellurium trihalides, diaryltellurium dihalides, diaryl tellurides, diaryl ditellurides, inorganic telluride etc. in different organic transformations.

The thesis entitled “STUDIES ON THE APPLICATIONS OF TELLURIUM REAGENTS IN ORGANIC SYNTHESIS” has been divided into six chapters.

The first chapter is a review of literature on various aspects of chemistry of tellurium and its organic derivatives. The applications of organotellurium compounds with a special emphasis on tellurium reagents in organic synthesis, have been compiled in this chapter. An objective of the present work has also been discussed.

In the second chapter purification of solvents used for preparations and recrystallization of compounds, preparations of tellurium reagents and physical methods used for the characterization of products have been described.

Third chapter deals with the applications of \( p \)-methoxyphényltellurium trichloride, \( p \)-hydroxyphényltellurium trichloride and 3-methyl-4-hydroxyphényltellurium trichloride as catalyst in knoevenagel condensation between non-enolizable aldehydes and active methylene compounds to yield the corresponding olefinic products. The knoevenagel condensation reactions of ethylcyanoacetate, malononitrile and cyanoacetamide with benzaldehyde, \( p \)-chlorobenzaldehyde, anisaldehyde and E-cinnamaldehyde in presence of aryltellurium trichlorides have been investigated.
The fourth chapter describes reducing property of tellurides and ditellurides. Disodium telluride, Na₂Te; diaryl telluride, R₂Te; diaryl ditelluride, R₂Te₂; (R = p-methoxyphenyl, p-hydroxyphenyl and 3-methyl-4-hydroxyphenyl) have been investigated as reagents for the pinacolization of aromatic aldehydes in presence of potassium hydroxide in methanol at room temperature. Pinacolization of thirteen aromatic aldehydes: benzaldehyde; 2-, 3-, 4-chlorobenzaldehydes; 2- and 4-bromobenzaldehydes; 2, 4- and 2, 6-dichlorobenzaldehydes; 2-, 3- and 4-methylbenzaldehydes; 4-methoxy and 4-hydroxybenzaldehyde have been studied.

The fifth chapter includes investigations on oxidising property of arytellurium(IV) halides. Oxidative chlorinating property of three aryltellurium trichlorides, ArTeCl₃ (Ar = p-methoxyphenyl, p-hydroxyphenyl, 3-methyl-4-hydroxyphenyl) and diaryltellurium dichloride, Ar₂TeCl₂ ( R = p-methoxyphenyl) have been investigated for conversion of di- and triorganylphosphites into corresponding diorganyl chlorophosphates at room temperature. Phosphites investigated are: trimethyl phosphite, triethyl phosphite, tri-n-propyl phosphite, di- and tri-n-butyl phosphites, tri-iso-butyl phosphite, triphenyl phosphite and tri-o-tolyl phosphite.

A Resume and Further Scope of the Work is given in the sixth and last chapter.