AIM OF THE PRESENT WORK

Metal tetraalkoxides $\text{M(OR)}_4$ and metal alkoxy compounds $\text{MX}_x(\text{OR})_{4-x}$ [where $R$ = alkyl, $X$ = halogen and $x = 1, 2$ or $3$] have been known for many years and recent reviews (141, 142) are available regarding their chemistry. The tetraalkoxides are coordination polymers $[\text{M(OR)}_4]_n$ ($n \sim 3.5$ for lower aliphatic $R$ groups). X-ray structural work on the three alkoxides $\text{Ti(OCH}_3)_4$ (143), $\text{Ti(OCH}_3)(\text{OC}_2\text{H}_5)_3$ (144) and $\text{Ti(OC}_2\text{H}_5)_4$ (145) has shown that in each case the molecule is a tetramer in the solid state. All titanium atoms are octahedrally coordinated to six oxygen atoms. Because of this fact titanium tetraalkoxides have little acceptor capability. The degree of polymerization
in metal alkoxides may be decreased by replacing alkoxide groups by electron-attracting atoms successively or by incorporation of an electron-attracting atom or group of atoms in the alkoxide group. It is expected that as the degree of polymerization is lowered, the acceptor character of metal may be enhanced.

This possibility has been found to be real in the case of alkoxy tin(IV) (139) and alkoxy antimony(V) chlorides (102, 103). The present work aims at examining this possibility for the corresponding titanium complexes where not much work has been earlier done. A few known compounds in case of titanium alkoxides, halo- and halide alkoxides have not been even well characterized.

The present work aims at the preparation and characterization of the known alkoxides, TiCl$_3$(OCH$_3$)$_3$, TiCl$_3$(OC$_2$H$_5$)$_3$, TiCl$_2$(OCH$_3$)$_2$·CH$_3$OH and the new alkoxides TiCl$_3$(OC$_2$H$_4$Cl)$_3$ and TiCl$_2$(OC$_2$H$_4$Cl)$_2$ and examining their interaction with various ligands. The ligands employed for such purpose in the present study are dimethylformamide, dimethylacetamide, tetramethyl urea, pyridine N-oxide, α-,β- and γ-picoline N-oxides, α,α'-dipyridyl N,N'-dioxide, dimethylsulphoxide, naphthaldehyde, phthalimide, succinimide, hexamethylphosphoramidite, triphenylphosphine oxide, triphenylarsine oxide and some nitrogen donor ligands such as pyridine, α,α'-dipyridyl, 1, 10 phenanthroline, acetonitrile, nicotinamide and 8-hydroxyquinoline. The characterization of the reaction products is being followed by their analytical data, melting points, molar conductance, infrared spectra, thermogravimetric data and thermochemical measurements.