INFRARED MATRIX ISOLATION STUDY OF THE REACTION OF $TiCl_4$ WITH LEWIS ACIDS; SPECTROSCOPIC CHARACTERIZATION OF Cl_3TiOCH_3

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The reaction of $TiCl_4$ with NH_3, CH_3OH and other Lewis bases in twin jet and merged jet deposition systems followed by trapping in argon matrices at 14 K has been examined. With twin jet deposition, formation of the initial intermediate, a 1:1 complex, was observed in each case. In a merged jet reactor, the reaction of $TiCl_4$ with CH_3OH proceeded very rapidly to a second intermediate, monomeric Cl_3TiOCH_3, which has been observed for the first time. Identification and characterization was carried out by extensive isotopic labeling, and comparison to density functional calculations. Increasing the temperature of the merged jet region to above 200deg C led to the complete destruction of this species, and formation of additional products. Recent results on these and related systems will be reported.