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Synthesis and Characterization of Silatelluro Heterocycles

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ABSTRACT

This article is mainly concerned with the synthesis and structural investigations of Silatelluroheterocycles bearing with the organic ligands containing silicon center that are established by trimethylsilyl and halogen bearing alkyl organic substrates. Attempts will be made to generalize the role of silicon and halogen in the stabilization of high valent tellurium compounds and that of intramolecular SBIs in the tailored synthesis of organotellurium derivatives capable of forming supramolecular motifs relevant to the field of crystal engineering.

Keywords- SBIs: Secondary bonding Interactions

I. INTRODUCTION

Organ tellurium compounds have attracted considerable interest is the recent past in the fields of (1) organic synthesis [1,2] (2) material science owing to their semiconducting[3], superconducting [4,5], non-silver photo-imaging[6] and liquid crystal properties and (3) coordination chemistry as telluroether ligands[7,8]. In recent years more emphasis has been paid on the use of organ tellurium compounds in organic syntheses and also in the study of inter- and intra-molecular secondary bonding interactions between the hypervalent tellurium atom and other nucleophilic atoms viz. X, O, N, S present in the molecule. Intermolecular interactions are expected to be present in organotelluriums containing functionally substituted organic groups. A direct route to α-carbonyl or α-amido functionalized organotelluriums, involving insertion of elemental tellurium in to C_{sp3}– Br bond of an acylmethyl or amido methyl bromide ($RCOCH_2Br$), has been developed and exploited in our laboratory. By the use of bulky groups it has been possible to obtain dialkyltelluroethers, $(RCOCH_2)_2Te$ (R = Mes) and $(RCOCH_2)ArTe$ (R = *i*-Pr, Mes; Ar = Mes, Np) in crystalline state. Pronounced steric rigidity along the Te–$C_{mesityl}$ bond was observed even upto 100 °C in case of $(t\text{-}BuCOCH_2)(mesityl)TeCl_2$. With this experience it is now proposed to use oxidative insertion of Te into iodoalkyls of silicon to prepare trimethylsilyl substituted alkyltellurium(II) compounds which may lead to, on halogenation, haloalkyl telluriums (Scheme A) or may be precursors to MOCVD studies on pyrolysis. Heterocycles with Te and Si atoms in the ring may result from a similar insertion reaction (Scheme B). Diorgano ditellurides, RTeTeR (R=alkyl, aryl), are versatile starting materials in organotellurium chemistry, such as for the preparation of organic charge-transfer complexes and ion-radical salts possessing high conductivity. Common routes for the preparation of ditellurides involve the reaction of organolithium or organomagnesium reagents with tellurium powder followed by air oxidation or, alternatively, the reduction of organotellurium(IV) halides. Occasionally, these procedures also give rise to the formation of rather unstable diorgano tritellurides, RTeTeTeR (R=alkyl, aryl), in varying amounts. In view of the pronounced steric and electronic effects of 1-naphthyl group, its influence relative to phenyl, on supramolecular self-assembly in the case of unsymmetrical diaryltellurium(IV) dihalides appears to be an interesting subject for studies.

II. RESULT AND DISCUSSION

Synthesis and characterization of *Silatelluro heterocycles containing* Tellurium of alkyl derivatives are given in Scheme 1 & 2.

Scheme 1. Synthesis of haloalkyltellurium derivatives by insertion of Te across Carbon halogen bond

Me

Scheme 2. Synthesis of silatelluro heterocycles by insertion of Te across Carbon halogen bond

III. CONCLUSION

Synthesis and characterization of novel organochalcogen derivatives has been established.

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