SYNTHESIS AND STRUCTURE OF 1-IODODIMETHYLSILYLMETHYL-2-PIPERIDONE

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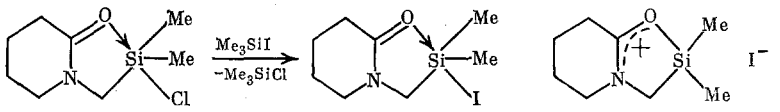
The reaction of N-silylated lactams with chloromethyldimethylchlorosilane leads to N-chlorodimethylsilylmethyllactams with a pentacoordinated silicon atom [1]. The chlorine atom in these lactams is readily exchanged by another substituent upon treatment with trimethylsilyl compounds. Thus, the reaction of 1-chlorodimethylsilylmethyl-2-piperidone (I) in absolute benzene with Me_3SiI gives a virtually quantitative yield of iodide (II), mp 200 °C (decomp.) as colorless crystals which rapidly turn yellow upon standing.



An x-ray diffraction structural analysis of (II) using 1665 reflections (R = 0.018) showed that the silicon atom has distorted trigonal bipyramidal configuration with oxygen and iodine atoms at the axial positions. The coordination may be described as (4 + 1) with an additional weak Si ← I interaction at 3.734(1) Å, which was observed here for the first time. This length is only 0.3 Å less than the sum of the van der Waals radii of the silicon and iodine atoms.

The very enhanced electrical conductivity of a solution of (II) in CH_2Cl_2 ($\lambda = 75 \cdot 10^{-6}$ $\Omega^{-1} \cdot m^2$) relative to a solution of (I) ($\lambda = 2 \cdot 10^{-6}$ $\Omega^{-1} \cdot m^2$), the significant differences in the IR spectra of these solutions, the high melting point, and the poor solubility in nonpolar organic solvents indicate dissociation of (II) in polar solvents with the formation of 5-sila-1,3-oxazolidinium iodide (III).

LITERATURE CITED

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