First X-Ray Structure of a Cationic Silicon Complex with Salen-Type Ligand: An Unusual Compound with Two Different Si-N Dative Bonds

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Two novel compounds containing pentacoordinate alkylsiliconium-cations with an $\langle O,N,N,O\rangle$-chelating ligand of salen-type were prepared by reacting the trimethylsilyl derivatives of the ligand with alkyltrichlorosilanes. Pentacoordination of the silicon atom is found in solid state as well as in solution. Crystals of compound **2a**, ethylene-N,N'-bis(2-oxy-4-methoxybenzophenoneiminato)methylsiliconium chloride, were obtained from chloroform solution. This complex crystallizes in monoclinic space group $P2_1/n$. The chloride ion is surrounded by three chloroform molecules in the solid state. The siliconium cation has trigonal bipyramidal geometry in the solid state, although the signals of two chemically equal half-sides of the salen-type ligand were revealed in ^{1}H and ^{13}C NMR spectra of its chloroform solution. Therefrom two different Si-N dative bonds within the same molecule arise. The reaction of methyltrichlorosilane with two non-linked "half-ligands" of the salen-type leads also to a siliconium complex with similar cationic coordination sphere motif.

Key words: Chelates, Hypercoordination, Pentacoordinate, Schiff Base, Silicon