Synthesis, Structures and Reactions of Trimethyltantalum(V) Bis[tri(*tert.*-butyl)silanolate]

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Bis[tri(*tert.*-butyl)silanolato]tantalum(V) trichloride reacts with LiMe to give trimethyl-bis[tri-(*tert.*-butyl)silanolato]tantalum(V), **6**. Its molecular structure shows a trigonal-bipyramidal coordination of the Ta atom with the Me groups in the equatorial plane. Its reaction with catecholborane produces preferably *B*-methyl-catecholborane besides some phenylene-1,2-dioxo-bis(1,3,2-dioxaborolane), **9**, and $H_3B \cdot THF$. Similarly, the reaction of **6** with dimeric 9-borabicyclononane (9-BBN) generates preferable tri(*tert.*-butyl)siloxy-9-BBN (75 %) and Me-9-BBN (25 %). In contrast, cleavage of the Ta–O bonds is the preferred route in the treatment of **6** with $H_3B \cdot THF$. ^{11}B NMR shows the formation of $(t\mathrm{Bu_3SiO})_2\mathrm{BH}$ and $(t\mathrm{Bu_3SiO})_3\mathrm{B}$ or $(t\mathrm{BuSiO})_3\mathrm{B_3O_3}$. No tantalum hydride could be isolated.

Key words: Trimethyl-bis(tri-*tert.*-butylsilanolato)tantalum, Reaction with Borane Derivatives, Molecular Structure