Synthesis and Reactivity of Novel Bis(stannyl)silanes


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Dedicated to Prof. Dr. H. Oehme on the occasion of his 60th birthday

Z. Naturforsch. 54b, 1188–1196 (1999); received June 30, 1999

Stannylsilanes, Rearrangement, Reactions with Alkynes, X-Ray Data

Bis(stannyl)silanes of types $R_3Sn-SiR'_2-SnR_3$ and $R_2(H)Sn-SiR'_2-Sn(H)R_2$ with $R'$ being methyl, phenyl, iso-propyl or tert-butyl have been synthesized by treatment of difunctionalized diorganosilanes with alkali stannides ($R = Me, tBu; R' = Me, tPr; 1 - 6, 8$) or with triphenyltin chloride and magnesium ($R = Ph; R' = Me, Ph, tPr; 7, 9$). $Me_3Sn-SiBu_2-SnMe_3$ was halogenated using $SnCl_4$, to yield the bis(chlorostannyl)silane $11$.

The reaction of bis(stannyl)diorganosilanes $R_3SnSiR'_2SnR_3$ with catalytic amounts of $Pd(PPh_3)_4$ resulted in unexpected rearrangements under formation of the silyldistannanes $R_3SnSnR_2SiR'R_2$. These compounds undergo addition reactions with alkynes. All compounds have been identified by NMR, IR, MS and elemental analysis. Compounds $5, 6$ and $7$ have also been characterized by X-ray crystallography.