N,N'-Bis(silyl)ethylendiamine und 1,3-Diaza-2-silacyclopentane – Synthese, Reaktionen, Strukturen

N,N'-Bis(silyl)ethylenediamines and 1.3-Diaza-2-silacyclopentanes – Synthesis, Reactions, Crystal Structures

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Silylethylenediamines, Bis[tris(silyl)ethylenediamino]silane, 1.3-Diaza-2-silacyclopentane

Ethylenediamine reacts with chlorosilanes to give N,N'-bis(silyl)ethylenediamines [$(H_2C\text{-}NHSiRR'R'')_2$, **3**: R, R' = Me; R'' = CMe_3; **4**: R = H; R', R'' = CMe_3; **5**: R, R' = CMe_3, R'' = OH]. In the reaction of N,N,N'-tris(trimethylsilyl)ethylenediamine with SiF_4 the difluoro-bis(1.1.4-tris(trimethylsilyl)ethylenediamino)silane (**6**) is obtained. The 1.3-diaza-2-silacyclopentanes $R_2Si[N(SiMe_2R')CH_2]_2$, **7 - 10** (**7**: R = Cl, R' = Ph; **8**: R = Cl, R' = CMe_3; **9**: R = H, Cl, R' = CMe_3; **10**: R = Br, R' = CMe_3) are isolated from the reactions of the corresponding bis(silyl)ethylenediamines and halosilanes in Et_2O with NEt_3 as HHal acceptor. Dilithium derivatives of N,N'-bis(silyl)ethylenediamines react with fluorosilanes with formation of the 1.3-diaza-2-silacyclopentanes, $R_2Si[N(SiMe_2R')CH_2]_2$ (**11 - 13**) (**11**: R = F, R' = Me; **12**: R = F, R' = CMe_3; **13**: R = $CHMe_2$, R' = Me). N-Fluoro-di(*tert*-butyl)silyl-N,N'-bis(trimethylsilyl)-ethylenediamine (**14**) is formed in the reaction of lithiated bis(trimethylsilyl)ethylenediamine with $F_2Si(CMe_3)_2$. **8** reacts in a molar ratio 1:2 with $NaNH_2$ or NaOMe with formation of **15** and **16**, respectively · $R_2Si[N(SiMe_2CMe_3)CH_2]_2$, **15**: R = NH_2; **16**: R = OMe]. 1.3-Bis(*tert*-butyl-dimethylsilyl)-2-*tert*-butyldimethylsiloxy-2-fluoro-1.3-diaza-2-silacyclopentane is the product of the reaction of **12** with $LiOSiMe_2CMe_3$. The crystal structures of **6** and **13** have been determined.