

Syntheses and Characterization of 1-Haloazagermatranes

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The reaction of tris(dimethylamino)halogermanes, $(\text{Me}_2\text{N})_3\text{GeHal}$ (**7**, Hal = Cl; **8**, Hal = Br), with tris(2-aminoethyl)amines, $\text{N}(\text{CH}_2\text{CH}_2\text{NHR})_3$ (**5**, R = H; **6**, R = Me), yield 1-halo-N,N',N''-azagermatranes (**1**, X = Cl, R = H; **2**, X = Br, R = H; **3**, X = Cl, R = Me; **4**, X = Br, R = Me). Treatment of **4** with *n*-butyllithium affords 1-*n*-butyl-N,N',N''-trimethylazagermatrane (**14**) in high yield. Reactions of *n*-BuLi with **7** or $(\text{Me}_2\text{N})_4\text{Ge}$ (**13**) lead to the formation of $(\text{Me}_2\text{N})_3\text{Ge-}n\text{-Bu}$ (**15**). On treatment of **15** with **5** the 1-*n*-butylazagermatrane **16** was obtained. The molecular composition and the structures of all new compounds were established by elemental analyses, ¹H and ¹³C NMR spectroscopy and mass spectrometry.