Silylfurans and Bis(silyl)butadiynes – Synthesis, Lithium Derivatives, Crystal Structures

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Silylbutadiynes, 2-Furanylsilanes, Lithium-fluorosilyl-(2-furanylsilyl)amide

Furan reacts with BuLi and halosilanes to give mono- (1, 5, 7), bis- (2, 6), tris- (3), and tetrakis(2-furanylsilanes) (4); (Fu-R; R = SiMe₂Cl (1), SiisoPr₂F (5), SiBu₄₂F (7); Fu-R-Fu; R = SiMe₂ (2), SiisoPr₂ (6); Fu₃SiBu (3), Fu₄Si (4)), 2,5-Bis(silyl)furans (8, 9) are obtained in the reaction of dilithiated furan and fluorosilanes in a molar ratio 1:2 (R-Fu-R; R = SiisoPr₂F (8), SiBu₄₂F (9)), 1,4-Bis(di-tert-butyldifluorosilyl)butadiyne (10) is formed from furan four equivalents of BuLi, and two equivalents of F₂Si₄Bu₂. 10 reacts with KOH to give ¹Bu₂(OH)Si-C≡C≡C≡C⁻SiBu₂OH (11). Substitution of the fluorine atoms of 5 and 7 by a NH₂ group occurs with MNH₂ (M = Li, Na). 12 and 13 are obtained. The reaction of 13 with BuLi and ¹Bu₂SiF₂ leads to the formation of FuSiBu₂NH⁻Si¹Bu₂F (14) and ¹Bu₂Si(NH-Si¹Bu₂,Fu)₂ (15). The lithium derivative of 14 crystallizes as monomer from THF as FuSi¹Bu₂N(LiTHF)₂Si¹Bu₂F and as a dimer containing a four-membered ring (16) from n-hexane (FuSi¹Bu₂NSi¹Bu₂LiF)₂ (17). The crystal structures of 4, 10, 16, 17 have been determined.