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LETTERS TO THE EDITOR

Thermal Addition of Diphenyl Disulfide to Ethynyltrimethylsilane in the Presence of Dimethyl Diselenide

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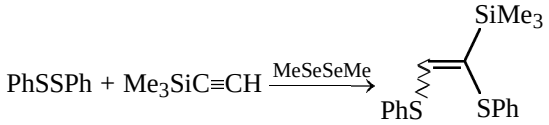
It is known that the radical reaction of the system diphenyl disulfide–diphenyl diselenide with acetylene derivatives occurs under UV irradiation and gives rise to thioselenation products, i.e. 1-phenylthio-2-phenylselenoethene [1]. Heating of dimethyl diselenide with alkynes yields 1,2-bis(methylseleno)ethenes [2].

We showed that thermal dithiylation of ethynyltrimethylsilane is strongly accelerated in the presence of equimolar or catalytic amounts of dimethyl diselenide. The reaction of diphenyl disulfide with ethynyltrimethylsilane in the presence of dimethyl diselenide (10 mol%) at 150°C provides 1,2-bis(phenylthio)-1-trimethylsilylethene in 60% yield (1:2 *E*:*Z* mixture). The yield of 1,2-bis(phenylthio)-1-trimethylsilylethene in similar conditions in the absence of dimethyl diselenide is as low as 7%.



It can be assumed that the catalytic effect of dimethyl diselenide consists of formation of an intermediate thioselenation product which then converts into the thermodynamically more stable 1,2-bis(phenylthio)-1-trimethylsilylethene.

The isomeric composition of 1,2-bis(phenylthio)-1-trimethylsilylethene was determined by ^{1}H NMR and GC–MS and confirmed by alkaline hydrolysis. The 1,2-bis(phenylthio)ethene [3] formed by hydrolysis has the same *Z*:*E* ratio as the starting compound.

The spectral and physicochemical characteristics of 1,2-bis(phenylthio)-1-trimethylsilylethene and 1,2-bis(phenylthio)ethene are consistent with published data [3, 4].

The ^{1}H NMR spectra were measured on a Bruker DPX-400 instrument (400 MHz) in $CDCl_3$, internal reference HMDS. The mass spectra were obtained at 70 eV.

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