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REACTION OF SELENIUM TETRABROMIDE WITH DIMETHYLDIETHYNYLSILANE

V. A. Potapov, S. V. Amosova, O. V. Belozerova, A. I. Albanov, O. G. Yarosh, and M. G. Voronkov

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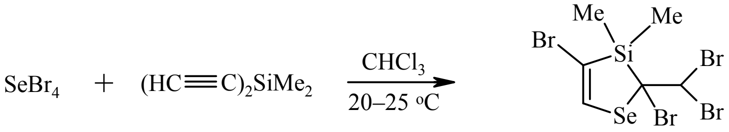
The addition of selenium tetrabromide to acetylene leads to bis(2-bromovinyl)selenium dibromide [1]. 2-Bromovinyl selenides are formed in the reaction of organic selenyl bromides with acetylenes [2-4]. There has been no information reported on the addition of selenium tetrahalides to diethynylsilanes.

We have found that the reaction of selenium tetrabromide with dimethyldiethynylsilane in chloroform at room temperature over 6 h leads to a previously unreported heterocyclic compound, namely, 2,4-dibromo-2-dibromomethyl-3,3-dimethyl-1-selena-3-sila-4-cyclopentene (**1**) in 60% yield.



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The structure of **1** was demonstrated using ^{1}H, ^{13}C, and ^{29}Si, ^{77}Se NMR spectroscopy and supported by elemental analysis. The ^{1}H NMR spectrum consists of two signals for the methyl group protons and two signals for the CH group protons. The difference in the chemical shifts of the methyl groups is probably explained by the chirality of the adjacent carbon atom.

2,4-Dibromo-2-dibromomethyl-3,3-dimethyl-1-selena-3-sila-4-cyclopentene (1); mp 102-104°C. ^{1}H NMR spectrum (400 MHz, acetone-d$_6$), δ, ppm: 7.74 (1H, s, =CHSe); 7.06 (1H, s, CHBr$_2$); 0.64 (3H, s, CH$_3$); 0.41 (3H, s, CH$_3$). ^{13}C NMR spectrum (100 MHz, acetone-d$_6$), δ, ppm: 133.64 (=CHSe), 112.44 (SiCBr), 67.34 (SiCSe), 49.32 (CHBr$_2$), -2.69 (CH$_3$Si), -7.86 (CH$_3$Si). ^{29}Si NMR spectrum (79 MHz, CDCl$_3$), δ, ppm: 21.54. ^{77}Se NMR spectrum, δ, ppm, (*J*, Hz): 707.48 ($^2J_{\text{Se–H}}$ = 52). Found, %: C 14.19; H 1.57; Br 63.14; Se 15.56; Si 5.54. $C_6H_8Br_4SeSi$. Calculated, %: C 14.20; H 1.58; Br 63.13; Se 15.57; Si 5.52.

A. E. Favorsky Irkutsk Institute of Organic Chemistry, Siberian Branch of the Russian Academy of Sciences, 664033 Irkutsk, Russia; e-mail: amosova@irioch.irk.ru. Translated from Khimiya Geterotsiklicheskikh Soedinenii, No. 4, pp. 634-635, April, 2003. Original article submitted March 26, 2003.

REFERENCES

1. V. G. Lendel, B. I. Pak, V. Yu. Migalina, M. Kuchi, M. Dzurilla, and P. Christian, *Zh. Org. Khim.*, **26**, 1849 (1990).
2. G. H. Schmid, in: S. Patai (editor), *The Chemistry of the Carbon-Carbon Triple Bond*, John Wiley & Sons, Chichester (1978), p. 275.
3. T. G. Back, in: D. Liotta (editor), *Organoselenium Chemistry*, John Wiley & Sons, New York (1987), p. 1.
4. V. A. Potapov, S. V. Amosova, B. V. Petrov, A. A. Starkova, and R. N. Malyushenko, *Sulfur Lett.*, **21**, 109 (1998).