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LETTERS
TO THE EDITOR

Reactions of Selenium Dichloride and Dibromide with Diallyl Telluride

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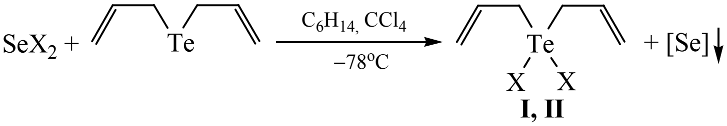
Selenium dichloride and dibromide are new effective electrophilic reagents for the synthesis of organoselenium compounds [1–14]. We have systematically studied the selenium dihalides reactions with the unsaturated organic chalcogenides, which afford the new functional compounds, including heterocyclic [6–14]. The selenium dihalides reactions with divinyl sulfide results in 6-membered heterocycles, 2,6-dihalo-1,4-thiaselenanes, that undergo rearrangement into the thermodynamically more stable 5-membered heterocycle, 5-halo-2-halomethyl-1,3-thia-selenolanes [6–8]. The reaction of selenium dihalides with divinyl sulfone affords 4- and 5-membered heterocycles, 2,4-bis(halomethyl)-1,3-thiaselenetane-1,1-dioxide and 5-halo-2-halomethyl-1,3-thiaseleno-lan-1,1-dioxide [9–11]. The addition of selenium dihalides to divinyl selenide gives 4-halo-2-halo-methyl-1,3-diselenolan [12–14].

Continuing the studies of the reactions of selenium dihalides with unsaturated chalcogenides, we studied the reactions of selenium dichloride and dibromide with diallyl telluride. Unlike the reactions with other unsaturated chalcogenides, this reaction was not found to afford the adducts to the double bond. The only products are respectively diallyltellurium dichloride **I** [15] and a previously unknown diallyltellurium dibromide **II** (quantitative yields). This is accompanied by the elemental selenium release.



I, II

X = Cl (**I**), Br (**II**).

The reaction was carried out by adding a solution of selenium dichloride or dibromide in $CC1_4$ to a hexane solution of diallyl telluride cooled to –78°C. Then the temperature was gradually raised to room temperature. The spectral characteristics of dichloride **I** are consistent with those for the known sample obtained from allyl trimethylsilane and $TeCl_4$ [15].

Thus, the direction of the reactions of selenium dihalides with the unsaturated chalcogenides is largely determined by the nature of the chalcogen atoms. In the reaction with diallyl telluride, selenium dichloride and dibromide behave as the selective halogenating agents for the tellurium atoms. The reactions feature by a high chemoselectivity: formation of any of heterocyclic compounds or products of the addition to double bonds is not observed.

Diallyltellurium dibromide (II). Mp 65–68°C (decomp.). ^1H NMR spectrum, δ, ppm: 3.19 d (4H, $TeCH_2$, ^3J 7.4 Hz), 5.03 d (2H, $=CH_2$, ^3J 10.3 Hz), 5.08 d (2H, $=CH_2$, ^3J 17.2 Hz), 5.88 m (2H, =CH). ^{13}C NMR spectrum, δ, ppm: 25.25 ($TeCH_2$), 116.69 ($=CH_2$), 135.58 (=CH). Found, %: C 19.83; H 2.91; Br 42.89; Te 35.02. $C_6H_{10}Br_2Te$. Calculated, %: C 19.50; H 2.73; Br 43.24; Te 34.53.

The NMR spectra were recorded on a Bruker DPX-400 spectrometer in $CDCl_3$ operating at 400.13 (^1H, HMDS) and 100.61 (^{13}C, HMDS).

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