

## SHORT COMMUNICATIONS

# Reaction of Divinyl Sulfide with Selenourea

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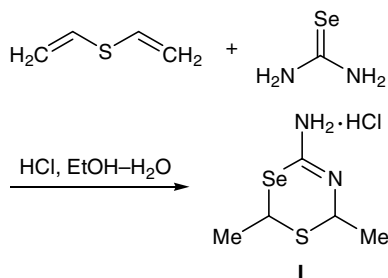
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Divinyl sulfide is a versatile intermediate product in modern organic synthesis [1–4], which is used to obtain various heterocyclic compounds [2–4]. Divinyl sulfide is known to react with thiourea and its derivatives in the presence of strong acids to produce 4-amino-2,6-dimethyl-2*H*,6*H*-1,3,5-dithiazinium salts [5–9]. There are no published data on reaction of divinyl sulfide with selenourea.

We have found that divinyl sulfide reacts with selenourea in the presence of hydrochloric acid, yielding 90% of previously unknown heterocyclic compound, 2,6-dimethyl-2*H*,6*H*-1,3,5-thiaselenazin-4-amine hydrochloride (**I**). The reaction occurs in aqueous ethanol at 50°C. The structure of compound **I** was proved by the <sup>1</sup>H, <sup>13</sup>C, and <sup>77</sup>Se NMR and IR spectra and elemental analysis. The product is an approximately equimolar mixture of *cis* and *trans* isomers.



**2,6-Dimethyl-2*H*,6*H*-1,3,5-thiaselenazin-4-amine hydrochloride (**I**).** mp 113–114°C. IR spectrum (KBr),  $\nu$ , cm<sup>-1</sup>: 670, 770, 960, 995, 1150, 1300, 1345, 1375, 1430, 1470, 1590, 1620, 3050, 3190, 3400. <sup>1</sup>H NMR spectrum (CDCl<sub>3</sub>),  $\delta$ , ppm: *cis* isomer: 1.53 d (6-CH<sub>3</sub>), 1.56 d (2-CH<sub>3</sub>), 4.95 q (6-H), 5.20 q (2-H),

11.40 s (NH<sub>2</sub>); *trans* isomer: 1.70 d (6-CH<sub>3</sub>), 1.89 d (2-CH<sub>3</sub>), 4.97 q (2-H), 5.27 q (6-H), 9.44 s (NH<sub>2</sub>). <sup>13</sup>C NMR spectrum (CDCl<sub>3</sub>),  $\delta_C$ , ppm: *cis* isomer: 19.58, 20.06, 36.48, 51.40, 169.80; *trans* isomer: 20.63, 26.41, 39.90, 57.08, 169.72. <sup>77</sup>Se NMR spectrum (CDCl<sub>3</sub>),  $\delta_{Se}$ , ppm: 470. Found, %: C 24.10; H 4.52; Cl 14.61; N 11.11; S 13.39; Se 32.42. C<sub>5</sub>H<sub>11</sub>ClN<sub>2</sub>SSe. Calculated, %: C 24.45; H 4.51; Cl 14.45; N 11.40; S 13.03; Se 32.16.

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