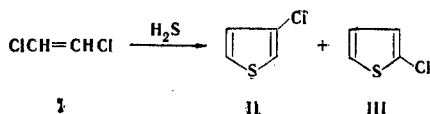


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We have established that the reaction of trans-1,2-dichloroethylene (I) with hydrogen sulfide in the gas phase leads to the formation of a mixture of 2- and 3-chlorothiophenes (II and III):



The formation of II evidently takes place via a known scheme [1]. Under the reaction conditions 2- and 3-chlorothiophenes are thermally stable and do not undergo isomerization to one another.

A 23.4-g sample of I was passed ($V = 10$ ml/h) through a hollow quartz tube (l 650 mm, d 30 mm) heated to 420°C in a stream of hydrogen sulfide ($V = 2-3$ liter/h), and the condensate was rectified to give 0.8 g of a fraction with bp 126°C (720 gage atm). According to the results of gas-liquid chromatography (GLC), this fraction was a mixture of thiophenes II and III. The overall yield was 16% based on the converted I. The degree of conversion of I was 40%. The chromatographic conditions were as follows: The instrument was an LKhM-8MD chromatograph, the liquid phase was 5% NZhF-Lukopren on Chromaton NAW-HMDS, the column was 2-m long, the carrier gas was helium, and the analysis was carried out under conditions of linear programming of the column temperature at $35-100^\circ\text{C}$ at a rate of $6^\circ\text{C}/\text{min}$. The retention times (τ) were 6.3 min for II and 5.8 min for III.

Compounds II and III were isolated by means of preparative GLC of the mixture with a chromatograph of the PAKhV type with a 2-m long column and 30% dinonyl phthalate on Chromaton NAW-HMDS at a column temperature of 110°C with helium as the carrier gas. The boiling points, n_D^{20} values, and PMR spectra of II and III were in agreement with the literature data [2]. Thiophene III was identical to an authentic sample of 2-chlorothiophene [3] according to analysis by GLC.

At 460°C the yield of thiophenes II and III was 12%, and the degree of conversion of I was 44%; at 480°C the yield of the mixture of II and III was 11.4%, and the degree of conversion of dichloroethylene I was 53%.

In addition to chlorothiophenes II and III, a mixture of six high-boiling compounds, which were identified, was isolated from the condensates.

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