B. For 20 min 0.4 g of compound XII, 30 ml of 50% aqueous dioxane, and 0.5 ml of 30% hydrochloric acid was boiled; then it was cooled and the precipitate removed.

8-(N,N-Dimethylacetamidino)-6H-benz[e]pyrido[4,3,2-g,h]perimidin-7-one (XIII). To 0.4 g of compound XII in 20 ml of dioxane we added 2 ml of dimethylamine, mixed for 1 h 30 min at 20°C, filtered off the precipitate formed, washed with dioxane, dried, and obtained the amidine XIII, which is converted upon heating in a capillary to the oxazole XII.

9H-Quino[5,4-e,f]perimidin-8-one (XIV). To a solution of 0.5 g of compound VI in 100 ml of water we added 35 ml of an aqueous solution containing 0.7 g of the carbonate and 0.7 g sodium hydrosulfite, mixed for 1 h at 40°C, cooled, filtered off the precipitate formed, washed with water, and dried.

6-Methylbenz[e]pyrido[4,3,2-g,h]perimidine-7 (XVII). A mixture of 1 g of compound XV, 10 ml of dimethylformamide, and 1 ml of phosphorus oxychloride was mixed for 2 h at 50°C, cooled, the precipitate removed, washed with chloroform, with ether, and the dimethylformamidinium salt XVII obtained, which was introduced into 30 ml of methanol, 1 g of ammonium acetate was added, mixed for 30 min at 20°C, the precipitate filtered off, washed with water, and dried.

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# INTERACTION OF 5-VINYLTETRAZOLE WITH TRIETHYLAMINE

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UDC 547.796.1

It was shown by the methods of UV spectrophotometry, conductometry, viscosimetry, and PMR spectroscopy that the interaction of 5-vinyltetrazole with triethylamine gives a polymeric salt of vinyltetrazole.

5-Substituted tetrazoles react with bases to form salts [1]. It is reported [2, 3] that polymeric salts are obtained by the reaction of hydrazine or triaminoguanidine with poly-5-vinyltetrazole.

We have suggested that 5-vinyltetrazole (VT), which exhibits the properties of a weak acid ($pK_a$ 4.1), will also react with bases to form salts that can be used to synthesize water-soluble polymers.

The process of interaction of VT with bases was investigated in detail on the example of the reaction with triethylamine (TEA). The absorption band of VT in ethanol ($\lambda_{max}$ 218 nm) is

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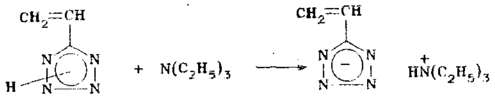
Translated from Khimiya Geterotsiklicheskikh Soedinenii, No. 7, pp. 994-995, July, 1984. Original article submitted August 10, 1983; revision submitted December 6, 1983.

0009-3122/84/2007-0812$08.50

shifted in the longwave direction (226 nm) when an equimolar amount of TEA is added, which may be due to the appearance of a negative charge on the tetrazole ring.



It was established by conductometric titration that when negligible amounts of TEA are added to a solution of VT in DMFA, a sharp increase in the electric conductivity is already observed; its maximum value is reached at an equimolar ratio of VT—TEA. An excess of TEA does not lead to any further change in the electric conductivity. When an equimolar amount of TEA is added to a soluton of VT in DMFA, the viscosity increases by 50%, but when the mixture is allowed to stand there is a decrease in the electric conductivity and an increase in the viscosity, which is caused by polymerization.

After the addition of an equimolar amount of TEA, the relative intensity of the signals of VT (observation of the protons of the vinyl group of VT) in the PMR spectra drops sharply and decreases even more with time. This is also an indication of the formation of oligomer salts.

When a mixture of VT-TEA in DMFA is treated with diethyl ether, a yellowish viscous mass is isolated; after drying under vacuum it is converted to a glassy state and does not dissolve in organic solvents but swells greatly in water. It can be dissolved in water only by multihour boiling in a Soxhlet apparatus. If, however, the reaction between VT and TEA is conducted without a solvent, then after treatment with diethyl ether and drying, a water-soluble product is obtained, in the PMR spectrum of which the signals of the vinyl group of VT are not detected. Consequently, the reaction of VT with TEA results in the formation of a polymeric salt, which, according to the data of elementary analysis and potentiometric titration, contains VT units both in salt and in acid forms, the ratio of which is close to equimolar. It should be noted that catalytic amounts of the amine do not lead to the formation of a polymer.

The reaction of VT with diethylamine, trimethylamine, hydrazine, ammonia, and NaOH also proceeds analogously, which permits its use for the synthesis of various polymeric salts of VT.

## EXPERIMENTAL

The UV spectra were recorded on a Specord UV-vis instrument in ethanol at a reagent concentration of $5 \cdot 10^{-3}$ M, the PMR spectra in acetone-$D_6$ and methanol-$D_4$ on a Bruker WP 200SY instrument (200 MHz), internal standard HMDS. The electric conductivity was measured on a P-38 conductometer in a cell with platinum electrodes (distance between them 1 cm) in DMFA at an initial VT concentration of 0.5 M. The viscosity of the solutions was determined with a capillary viscosimeter in DMFA. The composition of the polysalts of VT obtained was determined by potentiometric titration of aqueous solutions of the salts with 0.1 N NaOH. The pH was measured on a pH-340 potentiometer.

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