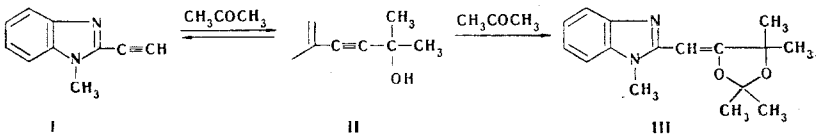
REACTION OF 1-METHYL-2-ETHYLBENZIMIDAZOLE WITH ACETONE

I. I. Popov, A. M. Simonov, and A. A. Zubenko

UDC 547.785.5'729.7:543.422.25.4

The final product of the reaction of 1-methyl-2-ethynylbenzimidazole (I) with acetone under the conditions of the Favorskii reaction (ether, potassium hydroxide) at the usual temperature (12-20°C) is not ethynylcarbinol II, as one should have expected, but rather 4-(2-benzimidazolyl)methyl-1,3-dioxolane (III) [colorless needles with mp 173° (from aqueous methanol or diethyl ether–petroleum ether)]. The yield was 62%. IR spectrum ($CHCl_3$): 1688 cm^{-1} (CH=C<). PMR spectrum ($CDCl_3$), ppm: 1.5 (H of four methyl groups of the dioxolane ring), 3.6 ($N-CH_3$), 5.2 (–CH=C<) and 7.2 (aromatic H).



I II III

Initially formed carbinol II apparently rapidly undergoes reaction with a second molecule of ketone under the reaction conditions to give a dioxolane. In fact, we were able to isolate alcohol II in the reaction of ethynylbenzimidazole I with a small excess of acetone (ether, KOH) at −5° in 78% yield as colorless prisms with mp 182° (from ethyl acetate). IR spectrum ($CHCl_3$): 2245 (C ≡ C) and 3600 cm^{-1} (OH). At the usual temperature with an additional amount of acetone, alcohol II was converted to dioxolane III in 87% yield. In contrast to the first step of the reaction, the second step is of short duration and is complete in 15-20 min.

The results of elementary analysis of II and III were in agreement with the calculated values.

Rostov State University, Rostov-on-Don. Translated from Khimiya Geterotsiklicheskikh Soedinenii, No. 1, p. 140, January, 1975. Original article submitted July 11, 1974.