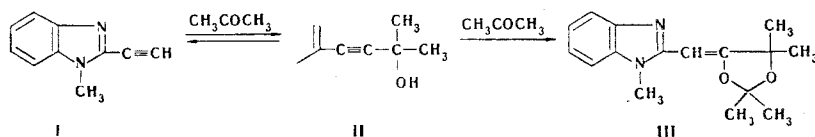


REACTION OF 1-METHYL-2-ETHYLBENZIMIDAZOLE
WITH ACETONE

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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 (CHCl₃): 1688 cm⁻¹ (CH=C<). PMR spectrum (CDCl₃), ppm: 1.5 (H of four methyl groups of the dioxolane ring), 3.6 (N-CH₃), 5.2 (–CH=C<) and 7.2 (aromatic H).



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 (CHCl₃): 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.

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