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COMPOUNDS REMOVED FROM THE CONDENSATION REACTION BETWEEN 2-ACETYLPYRIDINE AND 2-FORMYLPYRIDINE. SYNTHESIS, CRYSTAL STRUCTURE AND BIOLOGICAL EVALUATION

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Abstract. The research is devoted to the study of unexpected products that formed as a result of the condensation reaction between 2-acetylpyridine and 2-formylpyridine under the Claisen-Schmidt reaction conditions. The structure of the compounds was determined and confirmed using FTIR, ^{1}H and ^{13}C NMR spectroscopy, and X-ray diffraction technique. As a result, a sequence of reactions leading to the following compounds has been proposed: 1,3-bis(pyridin-2-yl)prop-2-en-1-one (**3**); 1,3,5-tri(pyridin-2-yl)pentane-1,5-dione (**4**); (2,4-dihydroxy-2,4,6-tri(pyridin-2-yl)cyclohexyl)(pyridin-2-yl)methanone (**5**) and (4-hydroxy-2,4,6-tri(pyridin-2-yl)cyclohexane-1,3-diyl)bis(pyridin-2-ylmethanone) (**6**) as well as 2-formylpyridine (**1**) and 2-acetylpyridine (**2**). The plausible mechanisms of these chemical transformations and synthetic methods for obtaining substituted cyclohexanol derivatives are also presented. The synthesized compounds were tested for antimicrobial and antioxidant activity. The obtained results show that the compounds **4**-**6** have moderate antifungal activity. The activity of compound **6** is nine times higher towards *Cryptococcus neoformans* than the activity of Nistatin that is used in medical practice. The present experimental results show that compound **6** has potential application in antibacterial and antifungal areas.

Keywords: 1,3-bis(pyridin-2-yl)prop-2-en-1-one, Claisen-Schmidt condensation, intramolecular aldol condensation, Michael addition, substituted cyclohexanol.

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