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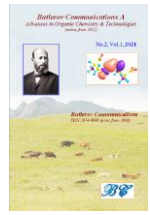

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Synthesis and structure of new derivatives of triazolo[4,3-a]pyrimidine and 2-phenylhydrazones of thiazolo[3,2-a]pyrimidine

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Abstract

The synthesis of new derivatives of thiazolo[3,2-*a*]pyrimidine and triazolo[4,3-a]pyrimidine by successive reactions of CH-active derivatives of thiazolo[3,2-*a*]pyrimidine with phenyldiazonium chloride and reduction reactions of the obtained 2-arylhydrazone derivatives with sodium borohydride in the presence of vanadium(V) oxide to form derivatives of triazolo[4,3-*a*]pyrimidine is proposed. The proposed mechanism of this rearrangement is the reduction of C=N to a hydrazine derivative, which then enters into an intramolecular rearrangement with the elimination of hydrogen sulfide and water molecules to form the target triazolopyrimidine derivative. Vanadium (IV) oxide, formed by reducing vanadium(V) oxide with sodium borohydride, removes sulfur from the bicyclic thiol intermediate, which contributes to the course of this reaction. The main convenience of this approach is the use of thiazolo[3,2-*a*]pyrimidines as starting compounds, which are readily available by condensation of 1,2,3,4-tetrahydropyrimidine-2-thions synthesized by the Biginelli reaction with derivatives of alpha-halocarboxylic acids and alpha-haloketones. Two synthesis methods were used for three-component Biginelli condensation. For aromatic aldehydes with donor substituents, the acetonitrile system and molecular iodine are used, and with acceptor

ones, the reaction was carried out in the absence of a solvent at 120 °C. Thiazolo[3,2-*a*]pyrimidine derivatives were obtained by reacting 1,2,3,4-tetrahydropy-rimidine-2-thions with an excess of ethyl chloroacetate. The reaction was carried out without solvent when heated to 120 °C within 2 hours. The structures obtained in accordance with this scheme differ in the presence of up to five different substituents in the thiazolopyrimidine nucleus. This provides the necessary interactions with the amino acids of the active center of the target protein, which as a result leads to the manifestation of a particular biological activity by the compound. The structure of the obtained compounds was established by a complex of physical methods, including NMR spectroscopy, MALDI mass spectrometry and X-ray diffraction analysis. The synthesized thiazolopyrimidines and triazolopyrimidines are among the promising structural fragments for the development of cytotoxic drugs.

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