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New technology to obtain 1-methyl-5-pnenyl-7-chloro-1,3-dihydro-2*H*-[1,4]-benzodiazepine-2-one

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Abstract

At present, benzodiazepine derivatives being used widely, they continue to occupy a leading position among the drugs of the anxiolytic group. Most anxiolytics of the benzodiazepine structure are derivatives of 1,4-benzodiazepine. The basis of the chemical benzodiazepine structure consists of a benzene ring connected to a seven-membered heterocyclic ring containing two nitrogen atoms (diazepine) at positions 1 and 4. All the benzodiazepine derivatives used in the clinic also have a second benzene ring attached to carbon. The presence of a halogen or a nitro group is essential to display its activity.

Diazepam (1-methyl-5-phenyl-7-chloro-1,3-dihydro-2*H*-[1,4] benzodiazepin-2-one) is in the list of necessary and important medicinal products. The urgent issue is the development of a new method to synthesize 1-methyl-5-phenyl-7-chloro-1,3-dihydro-2*H*-[1,4]-benzodiazepines-2-one that would allow producing the drug in the required quantities and for mass consumption.

The search for possible effective ways of synthesizing 1-methyl-5-phenyl-7-chlorine-1,3-dihydro-2*H*-[1,4]-benzodiazepines-2-one for manufacturing application is of great scientific and practical interest.

The purpose of our work is to search for a rational method to synthesize the target product, experimental study of the chemical processes to develop the most optimal methods to produce the product.

The technology to produce 1-methyl-5-phenyl-7-chlor-1,3-dihydro-2*H*-[1,4]-benzodiazepine-2-one on an industrial scale was developed.

The synthesis of 2-benzoyl-2',4-dichloro-*N*-methylacetanilide by condensation of 2-methylamine-5-chlorobenzophenone with chloracetyl chloride in carbon tetrachloride without further treatment of the reaction mass with water and sodium carbonate was developed.

The highest yield of 1-methyl-5-phenyl-7-chlorine-1,3-dihydro-2*H*-[1,4]-benzodiazepines-2-one was shown to be obtained if the cyclization reaction is carried out in isopropyl alcohol. The reaction mixture composition in interaction of 2-benzoyl- 2',4 -dichloro-*N*-methylacetanilide with urotropin plays the defining role in the formation of the target product.

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