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TASHKENT

Synthesis of isomeric 1-alkyl-2-methyl-5-chloro(6-chloro)benzimidazoles

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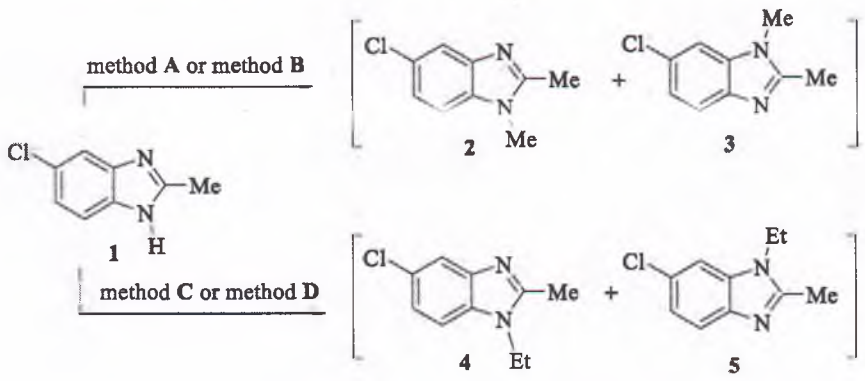
Currently, among the heterocyclic compounds, benzimidazole and its derivatives are of great theoretical and practical importance [1]. From the analysis of literature data, it can be seen that various benzimidazole derivatives have antimicrobial, anticancer, anti-inflammatory, analgesic, antituberculous and antiviral activities [2,3].

In order to protect the active proton of the nitrogen atom of 2-methyl-5-chlorobenzimidazoles an alkylation was carried out. Methyl iodide and ethyl bromide were used as the alkylating agent; the reaction was carried out in two ways. In the first case, the reaction was carried out in the presence of an acetone/potash mixture, in the second case, ethanol/NaOH. The reactions were carried out at different time intervals, with different molar ratios of the reagents; as a result, methods were chosen for obtaining products with a high yield (A, B, C, D).



method **A**: **1**:MeI:K_2CO_3 - 1:1:0.7, acetone, 56^{0}C, 6 h. (yield **2+3**: 62%);
method **B**: **1**:MeI:NaOH - 1:2:1, ethanol, 78^{0}C, 7 h. (yield **2+3**: 81.8%)
method **C**: **1**:EtBr:K_2CO_3 - 1:1:1, acetone, 56^{0}C, 5-6 h. (yield **4+5**: 58%);
method **D**: **1**:EtBr:NaOH - 1:3:1, ethanol, 78^{0}C, 6 h (yield **4+5**: 78%)

Due to the prototropic tautomery of benzimidazoles, the reaction results in a 1:1 mixture of two isomers. The structure of the isolated isomers of the dialkyl products (2-5) were analyzed and fully confirmed by IR, 1H, and 13C spectroscopy.

References

1. Xiang P. et al. Molecules. 2012, T.17, №.1, P. 873-883.

2. Kavitha C.S. Achar, Kallappa M. Hosamani, Harisha R. Seetharamareddy. European Journal of Medicinal Chemistry, 2010, 45, P.2048–2054.

3. Desai NC, Shihory NR, Kotadiya GM, Desai P., Eur. J. Med. Chem., 2014, 82, P.480–489.