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Preparation of *N*,*N*'-oxalyldiimidazole and investigation of its interaction with alkylamines and succinic acid

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Abstract

Purposeful synthesis of *N*-azolides of aliphatic dicarboxylic acids, study of the relationships between the structure of this class of compounds and their reactivity is an actual and scientifically valid search for new effective condensing agents.

N,N'-Oxalyldiimidazole was synthesized by the interaction of *N*-trimethylsilyl imidazole with oxalyl dichloride in absolute benzene. The reactivity of *N,N'*-oxalyldiimidazole was confirmed by reactions with octylamine, dodecylamine, octadecylamine and reaction with succinic acid. A procedure for the synthesis of oxalic acid amides from *N,N'*-oxalyldiimidazole and the corresponding aliphatic amines has been developed. A number of new compounds have been obtained, such as *N,N'*-dioctylethanediamide, *N,N'*-didodecadecyl ethanediamide and *N,N'*-dioctadecyl ethanediamide. By reaction of *N,N'*-oxalyldiimidazole with succinic acid, *N,N'*-succinyldiimidazole was obtained. The developed and described techniques in this article can be used for the synthesis of azolides of other carboxylic acids and their derivatives, in particular, those entering the Krebs cycle. The compounds synthesized by us were subjected to a virtual screening procedure in order to predict their biological activity in the PASS Online program. Often, many substances have high rates of biological activity, but because of high toxicity they do not find appropriate application in pharmacology and medicine. The prospects of their further investigation of new possible drugs are shown. In this case, the results of predicting the spectrum of biological activity in synthesized compounds have no toxicity.

The structure of the obtained compounds was confirmed by IR and ^{1}H NMR spectroscopy, and homogeneity by TLC. In the IR spectra, characteristic absorption bands were found to confirm the presence of the corresponding functional groups in the structures, signals of protons with characteristic chemical shifts for the corresponding functional groups were detected in ^{1}H NMR spectra.

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