

SYNTHESIS AND STRUCTURAL CHARACTERIZATION OF SUBSTITUTED DIARYLUREA DERIVATIVES OF BIOLOGICAL INTEREST

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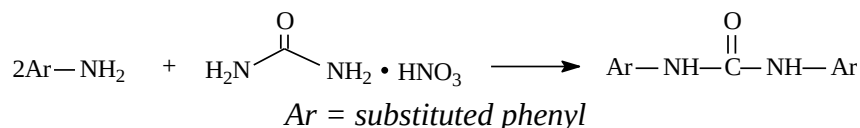
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Diarylureas are urea derivatives in which two aryl groups are attached to the nitrogen atoms of the urea moiety. The combination of aromatic fragments with the urea functional group provides structural diversity and enables hydrogen-bonding interactions, which contribute to the biological and medicinal interest of these compounds [1,2].

The properties of diarylureas are strongly influenced by the nature and position of substituents on the aromatic rings. Structural modifications of the aryl groups can affect their chemical and biological behavior. These structure–property relationships are important for the design and development of substituted urea-containing compounds with potential biological relevance [2,3].

General reaction scheme for the synthesis of diarylurea derivatives from aromatic amines and urea nitrate:



Our research focuses on the synthesis of substituted diarylurea derivatives from aromatic amines and urea nitrate under catalyst-free conditions. The experimental results demonstrate that the nature and position of aromatic substituents influence the efficiency of product formation. FTIR and NMR spectroscopy were used to confirm the structures of the synthesized compounds.

The biological interest of diarylureas has been demonstrated in medicinal chemistry, particularly in studies of anticancer and other pharmacologically relevant compounds, while structure–activity relationship studies indicate that modification of the aromatic substituents can substantially influence their biological properties [2]. Therefore, the synthesis and structural characterization of new substituted diarylureas are important for further chemical and biological investigation.

Keywords: diarylurea derivatives, aromatic amines, urea nitrate, catalyst-free synthesis, structural characterization.

References:

1. Ghosh A.K., Brindisi M. Urea Derivatives in Modern Drug Discovery and Medicinal Chemistry. *Journal of Medicinal Chemistry*. 2020;63(6):2751–2788.
2. Sun X., Xie Z., Lei X., Huang S., Tang G., Wang Z. Research and development of N,N'-diarylureas as anti-tumor agents. *RSC Medicinal Chemistry*. 2023;14(7):1209–1226.
3. Yusupova M.U. Aryl-substituted ureas. Synthesis, properties and crystal structure. *ChemChemTech [Izv. Vyssh. Uchebn. Zaved. Khim. Khim. Tekhnol.]*. 2025;68(12):51–57.