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A Study of Synthesis of Novel Heterocyclic Compounds from Different Organic Molecules

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ABSTRACT

The synthesis of novel heterocyclic compounds from different organic molecules is an important area of research in organic and medicinal chemistry. Heterocyclic compounds are chemical structures that contain at least one atom other than carbon, such as nitrogen, oxygen, or sulfur, within a ring structure. These compounds play a vital role in pharmaceutical science because many drugs and biologically active molecules contain heterocyclic rings. Researchers continuously explore new synthetic methods to develop novel heterocyclic compounds with improved chemical and biological properties. The synthesis process generally involves the reaction of various organic molecules such as aldehydes, ketones, amines, or other functionalized compounds under specific reaction conditions. Different techniques, including condensation reactions, cyclization reactions, and multicomponent reactions, are commonly used to construct heterocyclic ring systems. Catalysts, solvents, and temperature control also play a crucial role in improving the yield and efficiency of these reactions. Modern approaches often focus on eco-friendly and sustainable methods that follow the principles of green chemistry. Novel heterocyclic compounds synthesized through these methods have wide applications in the fields of medicine, agriculture, and materials science. Many of these compounds show potential biological activities such as antimicrobial, anti-inflammatory, anticancer, and antiviral properties. Therefore, the synthesis of new heterocyclic compounds from different organic molecules continues to be a significant area of scientific research and drug discovery.