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Synthesis, characterization and antimicrobial study of substituted N-(1-(benzothiazol-2-yl)-5-methyl-1*H*-pyrazol-3-yl) benzothiazol-2-amine derivatives

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Heterocyclylic derivatives of benzothiazole and pyrazole have been synthesized using both traditional and contemporary synthesis methods. The current study involves both conventional synthesis and catalyst-assisted techniques for the preparation of the desired organic compounds. Additionally, it includes the characterization of the synthesized compounds and a comparative analysis of traditional and modern methods in terms of reaction time, yield, and their applicability. A comprehensive overview of these compounds is presented, highlighting their chemical significance and potential applications in drug development. The central research question addresses the efficacy of synthesis methods and characterization techniques for these derivatives. This work not only contributes to the understanding of benzothiazole and pyrazole derivatives but also sheds light on their biological implications, aiming to pave the way for future research and application in pharmaceuticals.

Keywords: Heterocyclylic derivatives, Benzothiazole, Pyrazole, Synthesis methods, Catalyst, Dimethyl sulfoxide, NMR, FT-IR