



University of Zabol

Graduate School

Faculty of Science

Department of Chemistry

The Thesis Submitted for the Degree of Master of Science

(In the Field of Organic Chemistry)

Green synthesis of 5-substituted-3-amino-1,2,4-triazoles derivatives in deep eutectic solvents and the evaluation of their antimicrobial and antioxidant effects

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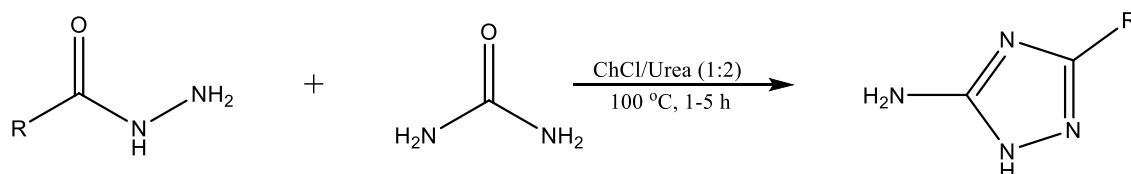
By

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Abstract

One of the goals of green chemistry is to use eco-friendly solvents. In this study, a new process has been presented under green chemistry conditions for the synthesis of 5-substituted 3-amino-1,2,4-triazole derivatives in deep eutectic solvents. Triazole derivatives were prepared from the reaction of hydrazide derivatives with urea in the absence of acidic and basic catalysts in eco-friendly deep eutectic solvents. The products were synthesized in good to excellent yields under easy work-up and purification conditions. The antibacterial effects of these products were evaluated through Kirby Bauer disc diffusion sensitivity test. Acceptable to significant inhibitory activity was observed with synthesized 3-amino-1,2,4-triazole derivatives. The results showed that 5(4-tert-butylphenyl)1,2,4-triazole-3-amine and 5(3-bromo-phenyl)1,2,4-triazole-3-amine are two broad-spectrum antimicrobial agents.



R= a: CH_3 , b: C_6H_5 , c: $4-O_2N-C_6H_4$, d: $4-(CH_3)_3C-C_6H_4$, e: $4-HO-C_6H_4$, f: $3-HO-C_6H_4$, g: $3-H_3CO-C_6H_4$, h: $3-Br-C_6H_4$, i: $3-HO$ -naphthalen-2-yl, j: Furan-2-yl, k: Thiophen-2-yl, l: $5-Cl$ -thiophen-2-yl, m: Pyridine-4-yl, n: 5-ph-isoxazol-3-yl

Keywords: 1,2,4-triazole, antimicrobial agents, green chemistry, deep eutectic solvents.