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Three Component Reaction for the Synthesis of Imidazo[2,1-b]thiazole Derivatives

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ABSTRACT

Three component one-pot reaction for synthesis novel of imidazo[2,1-b]thiazoles with high yield were obtained by the condensation of 4-phenylthiazol-2-amine, aromatic aldehyde and isocyanide.

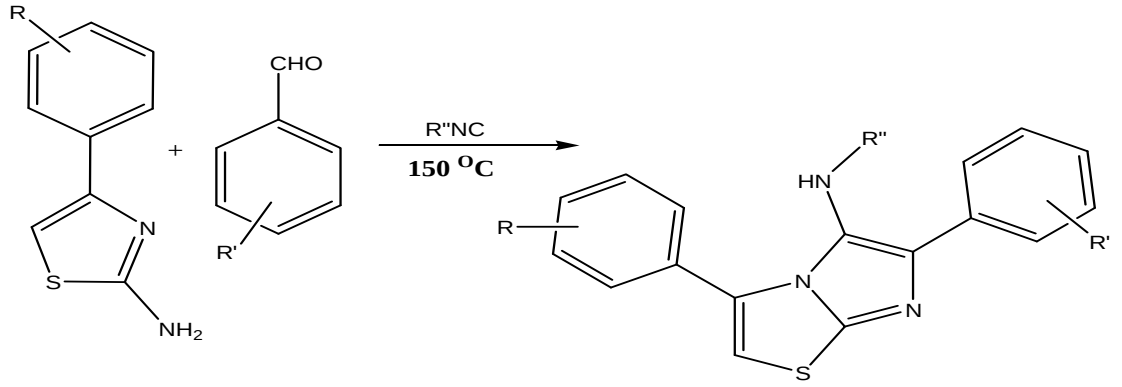
Key words: Imidazo[2,1-b]thiazole, Three Component, 4-phenylthiazol-2-amine, Isocyanide.

INTRODUCTION

Sulfur containing heterocyles are an important class of compounds in drug chemistry so five membered heterocyclic structures imidazole nucleus have different properties such as high therapeutic properties of drugs as chemotherapeutic agents is related to the imidazole that have encouraged the medicinal chemists to synthesize a large number of them. Imidazole expanded as drug therapy in clinical medicine. Most of the work on the synthesis and biological activities of fused imidazo [2,1-b]-thiazoles have been reported. Thus, Polycyclic heterocyclic derivatives with thiazole are suitable for drug design[1-2]. Synthesis of these compounds is of interest to chemists because imidazo[2,1-b]thiazoles are very important structure in the field of drug chemistry with wide range of biological and pharmacological activity[3]. The imidazo[2,1-b]thiazoles scaffold are important class of fused heterocycles with a show promise such as anti-inflammatory[4], antibacterial[5], antifungal[6], antihypertensive[7], and anticancer[8]. There are important routes not only employed for the synthesis of the title compounds.

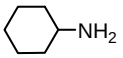
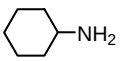
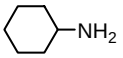
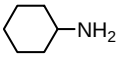
RESULTS AND DISCUSSION

As we said above, several methods have been proposed for imidazo[2,1-b]thiazoles over the years. Provide a essay method for synthesis imidazo[2,1-b]thiazole is very valuable. As part of our ongoing interest in developing new methods for the synthesis of various heterocyclic scaffolds[9-15]. Therefore in this study, we have synthesized derivatives of imidazo[2,1-b]thiazoles with the condensation of 4-phenylthiazol-2-amine, aromatic aldehyde and isocyanide in ethanol (Scheme 1).



Scheme 1: Reaction between 4-phenylthiazol-2-amine, aromatic aldehyde and isocyanide

Table 1: Synthesis of various 2-thioxoquinazolin-4(1H)-ones

Entry	R	R'	R"NH_2	Melting point °C	Yields(%)	IR ν_{N-H} cm^{-1}	^{1}H NMR (CDCl3) ppm
4a	H	Para-NO_2		149-151	65	3346	0.68-1.53 (m, 11H, Hcyclohexyl), 3.89 (s, 1H, NH), 6.89 (s, 1H, CH), 7.31-7.91 (m, 9H, Harom)
4b	H	Para-OCH_3		174-176	60	3288	0.51 (m, H, -CH), 0.97-1.86 (m, 10H, -CH2), 3.69 (s, 1H, NH), 3.85 (s, 3H, -OCH3) 7.13 (s, 1H, -CH), 7.41-7.92 (m, 9H, Harom)
4c	H	Orto-Br		170-171	62	3216	0.56 (m, H, -CH), 0.85- 1.34 (m, 10H, -CH2), 3.79 (s, 1H, NH), 6.78 (s, 1H, -CH), 7.37-7.88 (m, 9H, Harom)
4d	H	Orto-F		167-169	66	3502	0.39 (m, H, -CH), 0.49-1.41 (m, 10H, -CH2), 3.73 (s, 1H, NH), 7.11 (s, 1H, -CH), 7.30-7.98 (m, 9H, Harom)

Herein, we report synthesis of imidazo[2,1-b]thiazole derivatives, the reaction of 4-phenylthiazol-2-amine, aromatic aldehyde and isocyanide in ethanol in 60-66% yields and was completed within 3 hours (Table 1).

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