New and Facile Synthesis of 5-(2-amino-1,3-benzothiazol-6-yl)-1H-benzimidazol-2ol

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Abstract: Development and Application of New Methodologies for synthesis of Bioactive molecule reported synthesized 2-amino benzothiazole from substituted aniline, potassium thiocyanate and bromine in acidic condition. Even the synthesis of 5-substituted Benzimidazole derivatives has been synthesized by 2-amino thiophenol and pentane 2,4 dione and aniline under oxidant and metal free condition. In this paper Author adopting a new approach to conjugate 2-amino benzothiazole in 5-substituted benzimidazole which results in new series of compound. The new series of compound has been used as Analgesic, Antibacterial, Antiviral, Anticancer, Antifungal, and Antihypertensive.

Keywords: 5-substituted Benzimidazole, antibacterial, 2-amino benzothiazole, pharmacological activity.

Introduction: Benzimidazoles are an important class of heterocycles that are frequently used in drug and agrochemical discovery programs. It has been a property of heterocyclic compounds when two or more heterocyclic moieties fused together are able to show various pharmacological activity. In this paper authors proposed that 5-substituted benzimidazole when fused with 1,3 benzothiazol-2-amine yield 5-(2-amino-1,3-benzothiazol-6-yl)-1H-benzimidazol-2-ol. The proposed compound is useful in organic ligands, fluorescent whitening agent dyes and functional materials. Therefore, the construction of these type of compounds has always been of great intrest to organic and medicinal chemists and has consequently received much attention. Our approach to the synthesis of these compound can be explained as shown on scheme (1). Compounds were fully characterized on the basis of spectral data UV, IR, NMR.

Material & Methods: In the synthesis of 5-(2-amino-1,3-benzothiazol-6-yl)-1H-benzimidazol-2-ol, 5-substituted benzimidazole (0.10mole) is refluxed with 1,3 benzothiazole 2 amine (0.10mole) using reagent ester/amine substrate/lewis acid in the ratio of 1:3:3 and mixture is heated in a water bath at 100°C for 30 hr. The reaction mixture was cooled to room temp. quenched with water (3ml) and diluted with ethylacetate (5ml). The combined organic extracts were dried over anhydrous sodium sulfate and filtered. The crude product was then purified by flash chromatography on silica gel (H). benzimidazole derivatives was smoothly obtained in 80% yield. The newly synthesized final compound were screened for their antibacterial & antifungal activity.

Survey of Literature: Jinsong Peng et-al remarkably synthesized benzimidazole ring system which doesn’t require any additional reagents and having high value from both environmental & economical point of view. Saeed Balalaie et-al in their studies trying to prove that solvent free conditions has received considerable interest ascribed to increasing of global concern on a harmful chemical reagents on a replacement of noxious organic solvents in one of the most important goals in green chemistry. One more study has been done for benzimidazole is that they are useful in controlling blood pressure & respiration of anaesthetized rats & mice.

Result & Discussion: 5-(2-amino-1,3-benzothiazol-6-yl)-1H benzimidazol-2-ol have gained a great deal of interest and are considered as a privileged drug scaffold because of these various biological properties. This fused bicycle heterocycle is also important in the field of material science. These fragments have become an exciting area of synthetic interest and a number of efficient methods have been developed for the diversified synthesis of five substituted benzimidazole derivatives.

To the best of our knowledge there is no literature present of 5-(2-amino-1,3-benzothiazol-6-yl)-1H benzimidazol-2-ol derivatives. In continuation of our efforts to develop synthetic protocols for the fictionalization of substituted benzimidazole derivatives. For the construction of 5-(2-amino-1,3-benzothiazol-6-yl)-1H benzimidazol-2-ol from 5 substituted.
benzimidazole and 1,3benzothiazol-2-arnino using a reagent.

**Scheme 1**

![Scheme 1](image)

Scheme 1. Synthesis of 5-(2-amino-1,3-benzothiazol-6-yl)-1H-benzimidazol-2-ol

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**References**


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