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Research article

Synthesis and antimicrobial evaluation of some new benzthiazole oxime ether derivatives

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ABSTRACT

Some new oxime ether derivatives containing benzthiazole heterocyclic nuclei are synthesized. The reaction of 2-mercapto benzthiazo with α-halo ketones followed by reaction with hydroxylamine gave oxime derivatives which on reaction with alkyl halides viz. ethyl chloride, n-prop chloride, and n-butyl chloride in absolute ethanol afforded the target compounds 4a-l. The structure of all the synthesized compounds was confirm by spectroscopic methods like mass and NMR. All compounds after structural confirmation were tested for biological activities.

Keywords: Oxime ether derivatives, 2-mercapto benzthiazole, α-halo ketones, Alkyl halides, Biological activity

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INTRODUCTION

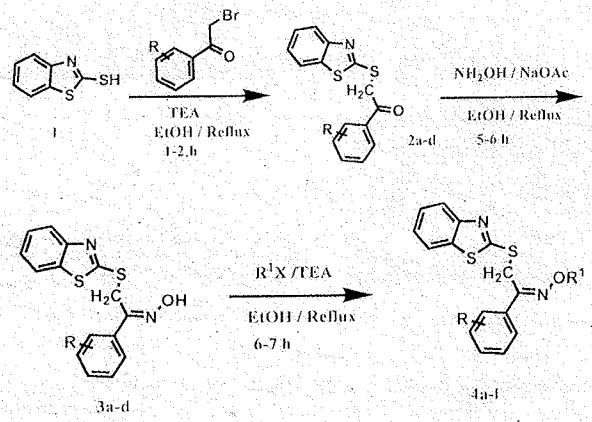
Oxime ether derivatives containing molecules have attracted significant consideration in agrochemical and medicinal research, due to excellent bioactivities such as insecticidal, [1, 2] fungicidal, [3-9] herbicidal, [10,11] another antitumor, [12-16] antiphytoviral, [17] acaricidal, [18] antiviral, [19] anticonvulsant, [20] antibacterial, and ectoparacidal activity.[21] Among the important heterocyclic nuclei, benzthiazole occupy a distinct place in drug discovery research. This is an important group of heterocycles that are substructures of many drug molecules. Derivatives of these heterocycles are an important part of therapeutic agents like anti-microbial, anti-viral, antihistaminic, anticonvulsant, antidepressant, and anti-tumor activity. Till today very little research has been done on oxime ether derivatives of benzthiazole derivatives. In view of the above considerations, the design and synthesis of newer antimicrobials remain an area of immense significance. This work deals with the synthesis of novel oxime ether molecules containing benzthiazole heterocyclic nuclei.

EXPERIMENTAL WORK

In this section, synthesis of new oxime ether derivatives containing benzthiazole heterocycle 4a-l is reported. The synthesized products were tested for biological activities against different bacteria and fungi shown in Table 1. The target molecules were synthesized as per the Scheme1. Reaction of 2-mercapto benzthiazole with α-halo ketones afforded S-substituted benzthiazole derivatives 2a-d.

Compounds 2a-d was further converted to their respectiv oxime derivatives 3a-d by reaction with hydroxyl amin hydrochloride and sodium acetate in ethanol. The oxime derivative were then refluxed with different alkyl halides viz. ethyl chloride, n propyl chloride and n-butyl chloride in absolute ethanol to obtai final products 4a-l.

Scheme 1: Synthetic route for 4a-l



RESULT AND DISCUSSION

The structure of the intermediates, 2a-d was confirmed b Spectral analysis. Signal in IR at 1690-1700 cm^{-1} is because presence of C=O group. The formation of the oxime was als