Synthesis of 2-(1H-imidazo[4,5-b]pyridin-2-yl)iminoo)-5-arylidenethiazolidin-4-ones, 1-(1H-imidazo[4,5-b]pyridin-2-yl)-5-methyl-3-aryl-1,3,5-triazinane-2-thiones and 3-(1H-imidazo[4,5-b]pyridin-2-yl)-5-aryl-1,3,5-oxadiazinane-4-thiones

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ABSTRACT

1H-imidazo[4,5-b]pyridin-2-amine (1) reacts with ammonium thiocyanate to form 1-(1H-imidazo[4,5-b]pyridin-2-yl)thiourea (2), which on reaction with chloroacetic acid gives 2-(1H-imidazo[4,5-b]pyridin-2-yl)imidazo[4,5-e]imidazo[4,5-b]pyridin-2-yl)-5-methyl-3-aryl-1,3,5-triazinane-2-thiones (6a-e) and 3-(1H-imidazo[4,5-b]pyridin-2-yl)-5-aryl-1,3,5-oxadiazinane-4-thiones (7a-e).

1. INTRODUCTION

Small ring heterocycles containing nitrogen, sulfur and oxygen have been under investigation for a long time because of their important medicinal properties. Among these types of molecules, 4-thiazolidinones have been shown to have various important biological activities such as antibacterial, antifungal, antiviral, diuretic, antituberculous, anti-HIV, antihistaminic, anticancer, anticonvulsant, antiinflammatory and analgesic properties (Capan et al. 1999; Vigorita et al. 2001; Kavitha et al. 2006; Ottana et al. 2005; Kucukguzel et al. 2006). 1,3,5-triazinane-2-ones are useful for the protection of amino groups, as well as for the synthesis of polyamines, poly functional aminoalcohols and water soluble triazinan-2-ones are used as fertilizers. Very few reports are available on the synthesis of heterocyclic 1,3,5-triazinan-2-ones (Knapp et al. 1992; Jasys et al. 1988; Hawkin,1988; Hardies, 1979a; Hardies, 1979b; Rajanarendar et al. 2004; Pradipet al. 2005; Rajanarendar 2005; Haedy, 2011; L axminarayana et al. 2008) and 1,3,5-oxadiazinanan-4-ones.
2. EXPERIMENTAL SECTION

Chemicals and solvents were reagent grade and used without further purification. Melting points were determined on a capillary melting point apparatus and are uncorrected. The 1H NMR was recorded in the indicated solvent on a Varian 500 MHz spectrometer with TMS as internal standard. All chemical shifts (δ) were reported in ppm from internal TMS. Mass spectra were measured on a Jeol JMS D-300 spectrometer. Infrared spectra were recorded in KBr on Brucher-IFS-66 FTIR spectrophotometer. The homogeneity of the compounds was checked using precoated TLC plates (E.Merk Kieselgel 60 F254).

Scheme 2

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Synthesis of 2-(1H-imidazo[4,5-b]pyridin-2-yl)-imidazo[4,5-b]pyridin-2-yl)thiourea (2a-e)

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