Spotlight 431

This feature focuses on a reagent chosen by a postgraduate, highlighting the uses and preparation of the reagent in current research.

Introduction

β-Oxodithioesters \(1\), sulfur analogues of β-ketoesters, are important synthons frequently used for the synthesis of heterocycles. \(1\) can easily be synthesized by the reaction of methyl ketones (or active methylene compounds) with dialkyl-, allyl-, or benzyl trithiocarbonates in the presence of NaH (Scheme 1).\(^1\) These versatile reagents are yellow and have a low melting point as well as an offensive odor.

![Scheme 1 Synthesis of β-oxodithioesters](Image)

Abstracts

(A) Samuel et al.\(^4\) reported the synthesis of thiophenes by alkylation of β-oxodithioester with α-haloketones. Depending on the combination of base and solvent, differently substituted thiophenes are obtained.

(B) β-Oxodithioester in the presence of DMAP reacted with dialkyl acetylenedicarboxylate to give 2,3,4-trisubstituted thiophenes in high yield in short reaction times.\(^5\)

(C) Samuel et al.\(^6\) have reported the synthesis of 2-ylidene-1,3-oxathioles in good yield using β-oxodithioester and α-haloketone in the presence of NaH in toluene.

(D) Chromene and benzochromene-2-thiones were efficiently synthesized in high yield by the reaction of β-oxodithioester and 2-hydroxy benzaldehyde/naphthaldehyde under solvent-free conditions using \(\mathrm{SiO}_2 \cdot \mathrm{H}_2\mathrm{SO}_4\) as the catalyst.\(^7\)

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(E) A facile and efficient protocol for the synthesis of benzo[\(f\)]chromene from \(\beta\)-oxodithioester and \(\beta\)-naphthol has been developed using catalytic \(\text{InCl}_3\). In this reaction, transesterification was also observed.\(^8\)

(F) Singh et al.\(^9\) have presented the synthesis of highly functionalized thiopyran/thiochromene derivatives when \(\beta\)-oxodithioester was treated with aldehyde and an active methylene compound containing a cyano group\(^9a\) or a 1,3-cyclohexanedione.\(^9b\)

(G) A green and highly efficient method for the regioselective synthesis of imidazo[1,2-\(\alpha\)]pyridine derivatives using \(\beta\)-oxodithioester, cyclic \(\text{N,N-acetal and aldehyde has been presented by Li and co-workers}\(^10\).

(H) Li and co-workers\(^11\) also reported an unprecedented, three-component cascade synthesis of imidazo[1,2-\(\alpha\)]thiochromeno[3,2-\(\alpha\)]pyridines under solvent-free conditions without using any transition-metal catalyst.

(I) Dihydropyrimidinones and dihydropyridopyrimidinones were synthesized via one-pot, three-component cyclocondensation of aromatic aldehydes, \(\beta\)-oxodithioesters, and urea/6-amino-1,3-dimethyluracil in the presence of a recyclable \(\text{SiO}_2\cdot\text{H}_2\text{SO}_4\) acid catalyst.\(^7\)

(J) The treatment of pyridine substituted \(\beta\)-oxodithioester with 2-bromoacetophenone led to the formation of highly substituted indolizine in moderate to good yield. The reaction was performed in chloroform in the presence of catalyst DBU/p-chloranil. Kakehi et al.\(^12\) have synthesized and analyzed the conformation of these molecules.

References


