Unveiling the choline chloride–thiourea (1:1) DES as a greener medium and reagent for pyrimidinethione synthesis from α,β-unsaturated carbonyl compounds †

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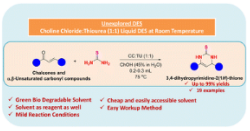
Abstract

Widespread studies on developing greener organic chemistry techniques were prompted by growing concerns about the health and environmental issues brought on by the effects of organic compounds. Since solvents and catalysts are necessary for many organic reactions, greener solvents and catalysts could remedy this problem. 3,4-Dihydropyrimidine-2(1*H*)-thiones (DHPMs) are an essential class of biomolecules. Several methods for synthesizing DHPMs have been reported. Nevertheless, most of these methods were linked to one or more disadvantages, such as laborious catalyst production, use of expensive catalysts, and severe reaction conditions like longer reaction times, higher temperatures and strong base, and reduced yields. Therefore, a simple, effective, and environmentally friendly protocol for the synthesis of 4,6-diaryl-3,4-dihydropyrimidine-2(1*H*)-thiones from α,β-unsaturated carbonyl compounds using the biodegradable, cheap, and easily accessible choline chloride : thiourea (CC : TU) 1 : 1 room temperature deep eutectic solvent (DES) is reported. The pyrimidinethione products were obtained from structurally and electronically diverse α,β-unsaturated carbonyl compounds in good to excellent (45–99%) yields under the optimized reaction conditions. The CC : TU (1 : 1) DES was used for the first time in a synthetic protocol, and it was found to be an augmenting medium and a reactant for the reaction. Hopefully, this paper will open doors to developing new DESs for synthesis. It will also encourage scientists to explore using CC : TU (1 : 1) as a solvent and reactant for several organic transformations involving thiourea.



Supplementary files

Supplementary information
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