GREEN SYNTHESIS OF COUMARINYL SCHIFF BASES UTILIZING CHOLINE CHLORIDE-BASED DEEP EUTECTIC SOLVENTS

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ABSTRACT

Due to the numerous advantages of deep eutectic solvents (DESs) compared to organic solvents, **the aim of this study was to synthesize coumarinyl Schiff bases utilizing ChCl-based DESs as a reaction media and a catalyst**, as well. We applied an environmentally friendly approach, utilizing a solvent made of biodegradable components, with low toxicity and vapor pressure, which can be easily recycled and reused.

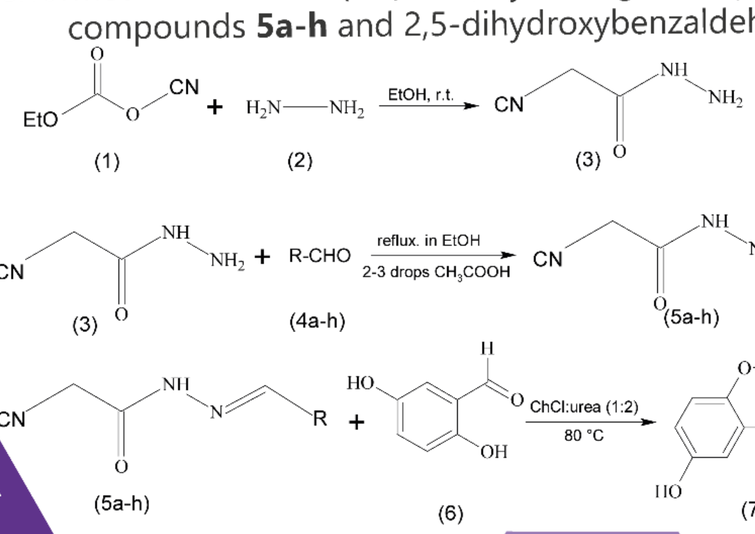
INTRODUCTION

Coumarin and its derivatives as highly bioactive heterocycles possess a wide spectrum of biological, pharmacological, biochemical and therapeutic properties, which are strongly structure dependent. Schiff bases bearing coumarin moiety in conjunction with imino group (-C = N-), form a significant class of compounds in medicinal and pharmaceutical chemistry.

DESs have proven to be a suitable media for many synthetic pathways. They are generally prepared by mixing a hydrogen bond acceptor (HBA) and one or more hydrogen bond donors (HBDs) that has the ability to form a eutectic mixture, which shows a significant lower melting point than their respective initial components. DESs are often described as green, biodegradable mixtures, whose properties can be adjusted for various applications using different molar ratios of HBAs and HBDs.

MATERIAL AND METHODS

Firstly, we prepared 2-cyanoacetohydrazide **(3)** from hydrazine hydrate **(1)** and ethyl cyanoacetate **(2)**. Schiff bases **(5a-h)** were prepared by refluxing equimolar amount of 2-cyanoacetohydrazide **(3)** and different aldehydes **(4a-h)**, in ethanol, with 2-3 drops of acetic acid. Afterwards, the synthesis of coumarinyl Schiff bases **(7a-h)** was performed in ChCl:urea (1:2) DES, by mixing the equimolar amounts of compounds **5a-h** and 2,5-dihydroxybenzaldehyde **(6)**.



R =
3-OCH_3-4-OH-C_6H_4;
3 Br-C_6H_4; 4-NO_2-C_6H_4;
3-Cl-C_6H_4; C_6H_4-O-C_6H_4;
2,5-OCH_3-C_6H_4;
4-OCH_3-C_6H_4;
3,5-OH-C_6H_4

RESULTS

DESs are proven the excellent media for all these reactions, while the isolation of the final product was easy, and included only the addition of water and filtration.

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