NATURAL DEEP EUTECTIC SOLVENT (NaDES) MEDIATED SYNTHESIS OF 2,3-DIHYDROQUINAZOLINONES

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ABSTRACT

2,3-Dihydroquinazolin-4(1H)-one derivatives belong to an important class of nitrogen heterocycles due to their broad range of potential biological pharmaceutical activities, including anticonvulsant, antihypertensive, antibacterial and anticancer. As intermediates, 2,3-dihydroquinazolin-4(1H)-ones can easily be oxidized to their quinazolin-4(3H)-one derivatives, which also are significant privileged structures in pharmaceutical synthesis [1,2].

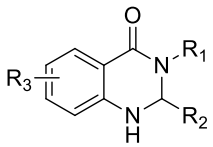

Figure 1: General structure of 2,3-disubstituted dihyroquinazolin-4(1H)-ones

Based on the importance of those compounds numerous classical methods have been described for their synthesis. In this study, we developed a synthetic approach towards of 2,3-dihydroquinazolinone analogues using green solvents, such as Natural Deep Eutectic Solvents (NaDESs). NaDESs are deep eutectic mixtures derived from natural products such as carboxylic acids, choline chloride, carbohydrates and other hydrogen-bond donors, they are recyclable, biodegradable and their properties can be tailored to meet the demands of the reactions. In this context, we have synthesized a series of NaDESs such as choline chloride / tartaric acid in 2:1 ratio (NaDES1), choline chloride/oxalic acid in 1:1 ratio (NaDES2), choline chloride/lactic acid in 1:1.5 ratio (NaDES3). These NaDESs were used as catalysts and solvents for the synthesis of 2,3-disubstituted dihyroquinazolin-4(1H)-ones via a multi-component reaction (MCR) among isatoic anhydride, benzaldehydes and aromatic amines. Multi-component reactions (MCRs) have some advantages over classic divergent reaction strategies, such as lower costs, shorter reaction time, and less side products, as well as environmentally friendlier aspects.

The present methodology provided the desired products in high yields (up to 85%), without tedious purification steps while the NaDESs were recovered and re-used for at least three times without loss of their catalytic activity.

The next goal is to study the developed synthetic approach using NaDESs for MCRs in combination with the ultrasonic irradiation technique, in order to achieve higher yields and even shorter reaction times.

REFERENCES

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