AN ALGINATE-SUPPORTED NADES SYSTEM FOR SUSTAINABLE CATALYSIS

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ABSTRACT

Sodium alginate is a naturally derived biopolymer that is well established in food and pharmaceutical industries and is recently emerging as a versatile material in catalytic applications [1,2]. Deep Eutectic Solvents (DES) are eutectic systems, formed between at least one Hydrogen Bond Donor (HBD) and one Hydrogen Bond Acceptor (HBA). When the HBD and HBA are selected from naturally occurring compounds, the eutectic system is characterized as Natural Deep Eutectic Solvent (NADES) [3]. NADES have a wide variety of applications such as extractions solvents , solvents and catalysts for organic reactions and many more [1-3,4,5].

Our research group introduces an innovative approach which exploits the unique properties of this biopolymeric matrix to create a supported NADES catalytic system. This system is resourcefully formulated into catalytic beads which offer high customizability and ease of handling [1]. Incorporating the crosslinking ability of specific NADES, these beads provide structural stability, whilst simultaneously, the integrated NADES serves as active catalyst for the promotion of esterification and transesterification reactions [6]. Key features of our proposed system include the biodegradability of the polymeric matrix, low catalyst loading and potential reusability. These aspects, cumulatively align with the growing demand for environmentally friendly solutions in chemical transformations, providing a path toward greener future.

KEYWORDS: Alginate-beads, NADES, Supported NaDES, Catalytic System, Sustainability

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