

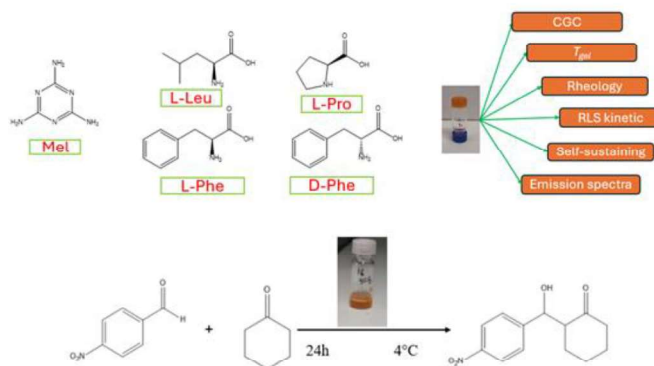
Melamine-amino acid based eutectogel as reusable catalyst for aldol reaction

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Controlling stereoselectivity during a chemical reaction is extremely important. Carbon-carbon (C–C) bond formation reactions often lead to asymmetric molecules that are essential to the synthesis of many compounds of pharmaceutical interest [1]. One of the principal strategies to control stereoselectivity in chemical reactions is the use of a chiral catalyst. Supramolecular gels can act as heterogeneous catalysts with interesting properties such as self-reparation capabilities, which are absent in conventional heterogeneous catalytic systems [2]. In this work, we explored the possibility to obtain catalytic eutectogels using composites of Melamine (Mel) and amino acids in a 2:1 molar ratio in a deep eutectic solvent, choline chloride: triethylene glycol (1:3) (ChCl:TEG). Amino acids investigated were L-proline (L-Pro), L-leucine (L-Leu), L-phenylalanine (L-Phe) and D-phenylalanine (D-Phe). For each gel, we determined gel-sol transition temperature (T_{gel}), gelation time and aggregated sizes, performing resonance light scattering (RLS) kinetics. In addition, for these gels, rheological measurements and self-sustaining tests are conducted. These eutectogels were used as heterogeneous catalysts for aldol reaction between *p*-nitro benzaldehyde and cyclohexanone.



The best catalyst was the L-Pro based gel. The best performance in terms of yield (around 70%), conversion (> 80%) and stereoselective control, syn/anti ratio (75/25) and enantiomeric excess (80%) was obtained at 4 °C for 24 hours without stirring. In addition, the catalyst was reused five times without significant decrease in terms of conversion and stereoselective control.

[1] H. Zhao, *RCS Adv. Int.* 14 (2020) 25932-25974.

[2] C. Rizzo, S. Marullo, F. Billeci, and F. D'Anna, *European J. Org. Chem.* (2021) 3148-316.