

Área: ORG

Synthesis of Dihydropyrimidinones via the Biginelli Multicomponent Reaction Catalyzed by Zeolites and Ionic Liquid

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Palavras-Chave: *Biginelli reaction, Zeolites, Ionic liquids.*

Highlights

- Biginelli Multicomponent Reaction in the Presence of Zeolites and Ionic Liquid (IL).
- 3,4-dihydropyrimidinone (DHPM) synthesis.
- Calcium channel blockers and antimetabolic activity.

Resumo/Abstract

Multicomponent reactions are reactions in which three or more components combine in a one-pot reaction to obtain a product containing all or most of the atoms of the reactants used. Specifically, the Biginelli reaction is a three-component reaction between β -ketoesters, aldehydes, and urea or thiourea, generating 3,4-dihydropyrimidinone (DHPM) as a product, which are compounds known to have different biological activities, such as calcium channel blockers and antimetabolites, among others.¹ Zeolites and mesoporous materials can be manipulated to modify their properties. One such modification is the anchoring of ionic liquids, which can be used as heterogeneous catalysts.² In this work, the imidazolic ionic liquid (LI) that was covalently anchored to zeolite Y (Figure 1) was used to test its catalytic activity in Biginelli reactions. The reagents used were urea, benzaldehyde and its derivatives, methyl acetoacetate, catalyst, and methanol as solvent (Figure 2). The best yield was obtained for the reaction with benzaldehyde (68.4%), and the catalyst recovery percentage was above 83% for all reactions. However, an X-ray diffraction (XRD) analysis was performed on the catalyst, which confirmed that it was pure and its structure intact. The use of the new catalyst enabled the desired products to be obtained, but further reactions will be necessary to obtain better and more significant results for the creation of a library of compounds.

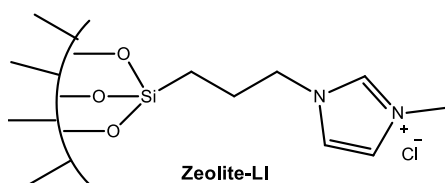


Figure 1: Functionalized material LI and Zeolite Y.

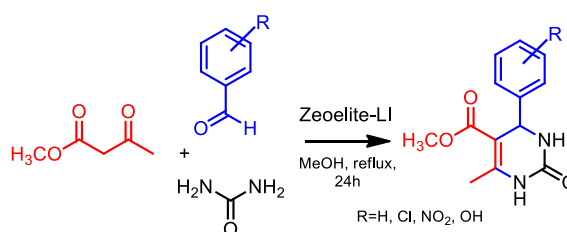


Figure 2: Biginelli MCR

¹ ROGERIO, K. et al. Reações multicomponentes: Um breve histórico e a versatilidade destas reações na síntese de moléculas bioativas. *Rev. Virtual Quim*, 8, 6, 1934-1962, **2016**.

² WEITKAMP, Jens. Zeolites and catalysis. *Solid State Ionics*, 131, 1-2, 175-188, **2000**.

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