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Sulfonic Acid-functionalized Chitosan as a Biodegradable Heterogeneous Organocatalyst in O-alkylation and A3 coupling Reactions

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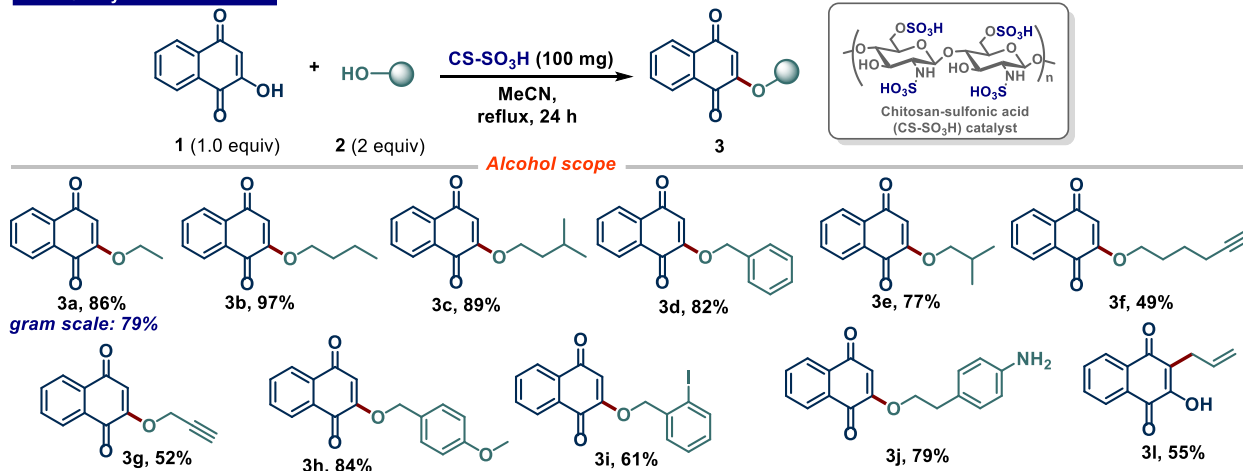
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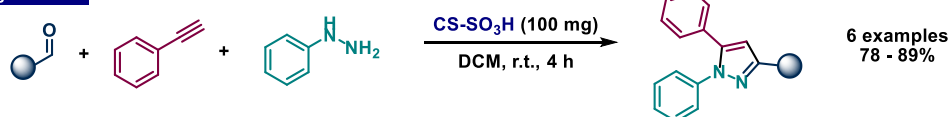
ABSTRACT

Advances in the field of heterogeneous catalysis have expanded the synthetic toolbox available for the preparation of densely functionalized molecules. Thus, the development and application of polymer-bound catalysts have increased over the past years.¹ In this context, chitosan (CS) is a good candidate for solid catalyst since it is natural, biocompatible, reusable and biodegradable. The numerous basic groups in this polysaccharide provide active sites for chemical modifications and stabilization of homogeneous catalysts.² One such chemical modification is sulfonation to produce chitosan-SO₃H (CS-SO₃H) which has been used as a solid acid catalyst in organic reactions.³ Herein, we describe the use of CS-SO₃H as a heterogeneous organocatalyst in a direct O-alkylation of lawsone with different alcohols and A3 coupling reaction for the synthesis of 1,3,5-substituted pyrazoles. The scope of both transformations showed good tolerance to the presence of different functional groups affording the corresponding products in satisfactory yields.

Direct O-alkylation of Lawsone:



A3 Coupling reaction:



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