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Cerium-Free Luche Reduction Directed by Rehydrated Alumina

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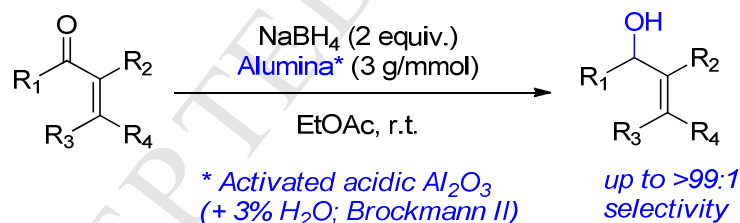
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Abstract: A 1,2-regioselective reduction of α,β -unsaturated ketones to their corresponding allylic alcohols is accomplished with NaBH_4 in the presence of acidic activated alumina rehydrated to the Brockmann II grade by adding 3% w/w water. The substrate scope includes eight ketones reduced in high regio- and diastereoselectivity to their corresponding allylic alcohols. This is the first example of the strategy of systematically tuning the surface chemistry of alumina via partial rehydration in order to modulate selectivity in a reaction. Alumina is an appealing alternative to the common Luche reduction additive, CeCl_3 , from the perspective of cost and procedural simplicity.

Key Words:

Alumina, Brockmann, Hydration, Selective Reduction, Unsaturated Ketones, Sodium Borohydride

Graphical Abstract:



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