

## Green synthesis of cyclohexanone glycerol ketal catalyzed by a solid superacid

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**Abstract** This paper discusses the synthesis of a glycerol ketal compound obtained from condensation reaction of cyclohexanone with glycerol catalyzed by a solid superacid. The solid superacid  $\text{SO}_4^{2-}/\text{TiO}_2\text{-La}_2\text{O}_3$  was prepared using coprecipitation and impregnation method and characterized by X-ray diffraction, thermogravimetric analysis, Fourier transform infrared spectroscopy and elemental analysis. The surface acidity was measured by thermogravimetric analysis of adsorbed n-butylamine. In order to achieve the optimal reaction conditions, five impact factors: molar ratio of glycerol to cyclohexanone, catalyst calcination temperature, reaction time, catalyst amount and molar ratio of Ti/La were investigated in the experiments. Synthesized ketal compounds were analyzed by GC-MS/MS. Under the best conditions, the cyclohexanone glycerol ketal yield could reach up to 97%.

*Keywords:* glycerol, solid superacid, cyclohexanone, ketals

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