

PINDU Abstract

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Title: Lewis Acid Catalyzed Acetalisation of Glycerol with Furfural

Traditional Lewis acids such as ZnCl_2 and $\text{Cu}(\text{OTf})_2$ are used as catalysts in the solvent free acetalisation of glycerol and furfural. Reactions are carried out at 100°C and a 5/1 molar ratio of furfural/glycerol, necessary to shift the equilibrium towards products. The condensation products are isolated as a mixture of 1,3-dioxolanes and 1,3-dioxanes (7:3 ratio), which can be hydrogenated with Pd/C under mild conditions. Additionally, solid acid catalysts, primarily aluminosilicate MCM-41 ($\text{SiO}_2/\text{Al}_2\text{O}_3=79$), are used to effect the condensation reaction. The MCM-41 catalyst has been examined for reusability and used to investigate a novel reaction methods designed to improve yields and reaction times through the elimination of water.