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Editorial

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Valorization of bioglycerol to value added products: Sulfonated mesoporous Polydivinylbenzene (PDVB) as an efficient solid acid catalyst for room temperature synthesis of solketal

Editorial:

Acetalization of glycerol with acetone is very significant reaction for synthesis of solketal (2, 2-dimethyl-4- hydroxymethyl-1, 3-dioxolane). Solketal can be used as an additive in formulation of diesel, biodiesel and gasoline fuels. It decreases the viscosity, improves cold properties and provides the required flash point to the biodiesel. These oxygenated products when blended with the diesel fuel curtail the uncontrolled emission of carbon monoxide, particles, hydrocarbons and aldehydes. Challenge in the synthesis of glycerol derivatives is the formation of by-product water which hinders the catalytic activity in case of silica due to low hydrothermal stability and commercial resins being too hydrophilic. Moreover, the commercial resins are not characterized by well-defined pores. Diffusion limitation and polymer swelling remain as disadvantage despite the development of large-pore resins, low-swelling polymers. In this work, sulfonic acid functionalized mesoporous polymer catalyst (MP-SO3H) was prepared by post synthetic modification of mesoporous polydivinylbenene by incorporating sulfonic acid moiety using conc. H2SO4. The synthesized materials were characterized by using several physicochemical techniques and their performance was evaluated for room temperature liquid phase acetalization of glycerol with acetone. MP-SO3H catalyst performed better than other conventional solid acid catalysts with 94 % glycerol conversion and 98.5 % selectivity for solketal. The high activity of MP-SO3H catalyst can be attributed due to facile diffusion of reactants and products in the mesoporous environment together with an optimized balance of acid functionalization. Glycerol conversion increased with increase in the total acidity of the catalyst. Amount of acidity and surface density of (H+) ions were found to have a direct correlation with catalyst performance.