

An overview of recent research in the conversion of glycerol into biofuels, fuel additives and other bio-based chemicals

ABSTRACT

The depletion of fossil fuels has heightened research and utilization of renewable energy such as biodiesel. However, this has thrown up another challenge of significant increase in its byproduct, glycerol. In view of the characteristics and potentials of glycerol, efforts are on the increase to convert it to higher-value products, which will in turn improve the overall economics of biodiesel production. These high-value products include biofuels, oxygenated fuel additives, polymer precursors and other industrial bio-based chemicals. This review gives up-to-date research findings in the conversion of glycerol to the above high-value products, with a special focus on the performance of the catalysts used and their challenges. The specific products reviewed in this paper include hydrogen, ethanol, methanol, acetin, glycerol ethers, solketal, acetal, acrolein, glycerol carbonate, 1,3-propanediol, polyglycerol and olefins.

Keyword: Biodiesel; Glycerol; Biofuels; Oxygenated fuel additives; Chemicals; Catalysts