Effect of molar ratio and water content for production of biodiesel and glycerol carbonate in solvent free system

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Biodiesel is made from renewable biological sources such as vegetables oils, animal fats and waste cooking oil. Glycerol carbonate (GC), value-added product of glycerol, has various applications which are sources of new polymeric materials, electrolytes, solvents in lithium ion batteries. The transesterification reaction was investigated by the immobilized lipase in a solvent-free system. Solvent-free system has many advantages of avoiding the problems of organic solvent about toxicity, separation and flammability of organic solvent. Experiments were carried out using dimethyl carbonate (DMC) to oil molar ratio in the range of 5:1-25:1, while other reaction conditions were set soybean oil, Novozym 435 (immobilized *Candida antarctica* lipase B) 20% (wt/wt, based on oil), 60 ℃, 180 rpm. Lipase is one kind of special enzymes acting at the interface between the aqueous and organic phase. The effects of water content on the conversion of biodiesel and GC were investigated.