Direct transesterification of chlorella Vulgaris using acidic ionic liquid, 1-methyl-3-imidazolium hydrogen sulfate

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Biodiesel production from Chlorella Vulgaris using Bronsted acidic ionic liquid (IL), 1-butyl-3-methylimidazolium hydrogen sulfate ([Bmim][HSO4]) was investigated via direct transesterification. The process was developed to reduce the energy used in drying biomass, which can save roughly 85% of the total energy consumption during biodiesel production, by simplifying extraction and conversion processes into a single step process. Using an IL in the single step process improved the lipid recovery efficiency due to strongly self-associating and hydrophilic property of IL which autopartition the lipid phase above the aqueous IL phase. With Chlorella Vulgaris (UTEX 265), it was found that the percent recovery of fatty acid from direct transesterification using IL was similar with conventional acid-catalyzed transeterification reaction. In addition, the amount of fatty acid products after tranesterification with different phases (solid or water) of Chlorella Vulgaris using IL was also investigated in this study.