A one-pot glycerol-based additive-blended ethyl biodiesel production: A green process

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A one-pot glycerol-based additive-blended ethyl biodiesel production: A green process

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Abstract

N-methyl-2-pyrrolidonium methyl sulfonate, a Brønsted acid ionic liquid, promoted the transesterification of soybean oil with ethanol giving a high quality fatty acid ethyl ester. At the end of the reaction, after distillation of excess of ethanol, spontaneous phase separation took place. While the clear upper phase corresponded to the ethyl ester, the lower phase was composed of a mixture of glycerol byproduct and the catalyst. By addition of a stoichiometric amount of appropriated reagents to the resulting mixture, a new ionic liquid-catalyzed process allows the conversion of the glycerol into less polar derivatives, and consequent migration to the ethyl esters phase. This work demonstrated that emulsion, phase separation and contamination problems were completely avoided and the glycerol could be incorporated into the biodiesel as additives in a single step. The whole process involves two renewable starting materials,

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