

Influence of various factors on the transesterification of soybean oil in supercritical methanol

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Biodiesel is an attractive alternative fuel because of its environment-friendly benefits and can be synthesized from renewable resources. In this study, the synthesis of biodiesel from soybean oil like edible grade in supercritical methanol without using any catalyst was investigated. The variables affecting the contents of FAMES during the transesterification reaction such as molar ratio of methanol to soybean oil, reaction temperature, pressure and time were studied. The treated samples were analyzed by gas chromatography using capillary column for the contents of FAMES and quantitated triglycerides, diglycerides, and monoglycerides. The optimal reaction conditions were given very high conversions and contents of FAMES. The kinetic behavior of soybean oil in supercritical methanol was investigated. The transesterification of soybean oil in such supercritical methanol could be formulated by first-order kinetic law at the initial stage of reaction. The activation energy for transesterification in supercritical methanol was evaluated isothermally.