

The influence of acidity on the phase equilibrium of the systems, including triglycerides, fatty acid and low molecular alcohol

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Abstract

Present work contains results of fat-containing wastes conversion research with the use of an acid-catalyzed esterification and transesterification reactions. The alkaline catalysis reactions are impossible in process, because the amount of free fatty acids in fat-containing wastes could vary from 3 to 40%. It is confirmed that the reaction rate is reduced under heterogeneous conditions, which are formed by reagents. It is showed that the sulfuric acid used as the acid catalyst, extends the heterogeneous area in binary system of free fatty acid – low molecular alcohols, system of triglycerides – low molecular alcohols, and ternary systems of triglycerides – free fatty acids – low molecular alcohols. The conditions of heterogeneous-homogeneous phase transition by the cosolvent using are defined. It is proposed to use a mixture of free fatty acids and fatty acids esters as cosolvents, which are required components of fat-containing waste conversion technology. It is also shown the possibility of phase composition modification by regulation the components ratios and by the selection of alcohol. Heterogeneous system with *n*-propanolol and *n*-butanol have the high ability to homogenization. The observed effects are explained by the view of intermolecular interactions.

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