

Study of emulsification properties of rapeseed oil alcoholysis products

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Fatty acid methyl esters (FAME) are widely used as a renewable substitute fuel for petroleum diesel. Their production technologies from vegetable oils or animal fats, using transesterification processes, have been frequently described in the literature [1, 2]. The experimental works carried out by many researchers in this field also concern the methods of fatty acid ethyl esters (FAEEs) production [3]. The ethyl esters can be used for similar purposes as the methyl ones. In order to obtain biocomponents for motor fuels a characteristic feature of all transesterification processes for vegetable oils is striving to shift the reaction equilibrium towards the products. The use of the alcohol (methanol or ethanol) excess in the reagents mixture provides substantially complete conversion of triglycerides. Additionally it enables the separation of the pure fatty acid esters from the post-reaction products. However, depending on the process conditions, among the reaction products apart from fatty acid esters there could be some other substances i.a. surface active agents (Figure 1).

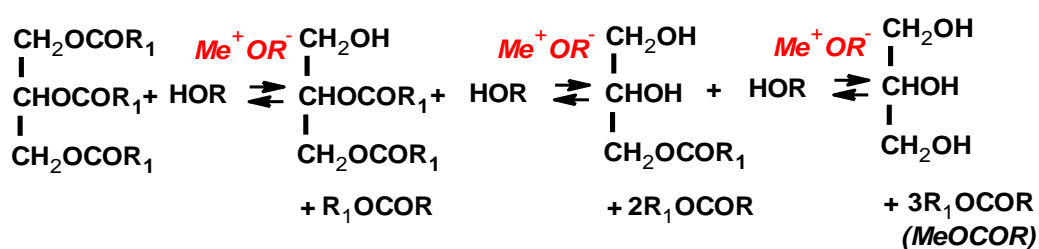


Figure 1. Alcoholysis process of vegetable oils in the presence of a homogeneous alkaline catalyst.

In the present work partial alcoholysis of rapeseed oil (average molecular weight of the oil 933 g/mol) with ethanol was carried out. The mixture of transesterification products consisted of mono- and diglycerides, ethyl esters, potassium salts of fatty acids and glycerin. The effect of the catalyst (KOH) concentration and the molar ratio of ethanol to the oil on composition of the post-reaction mixture and the emulsification properties of the obtained products were studied.

References:

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