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Biodiesel synthesis from vegetable oils in supercritical methanol in flow type reactor

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Abstract

Transesterification reactions of vegetable oils (rapeseed, sunflower-seed, corn and camelina) in supercritical methanol in a tubular flow reactor were studied over a wide range of methanol/oil ratio, pressure, temperature, and residence time. Special attention was focused on the studies of the product distribution and how it varies upon variation of the above reaction parameters. Reaction conditions to enable high selectivity and conversion of vegetable oils transesterification were determined. Advantages of the reaction in supercritical alcohols over similar reaction in the presence homogeneous catalysts were demonstrated. It was found that the oil type produced insignificant effect on the product composition (fatty acid esters) and oil conversion value.
The reaction of rape oil transesterification in the presence of heterogeneous catalyst – H-form of beta-type zeolite – was studied experimentally. Further studies were proved necessary to develop the highly active, selective and stable heterogeneous catalyst enabling the required product distribution at vegetable oil triglycerides transesterification.

Biography

Prof. V.Anikeev has the highest academic degrees - doctor of science since 1992. He is the head of energy chemical engineering group in the Boreskov Institute of Catalysis SB RAS and member of Russian Chemical Society. He has published more than 176 papers in reputed journals. He is the Principal Investigator of the many Russian and International projects.