

Thermophysical and Thermochemical Characteristics of Biodiesel Fuels Produced from Belarusian Vegetable Oils

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Vegetable oils and biodiesel fuels obtained from them are an alternative fuel source for vehicle engines and electrical plants. There are many oil-yielding crops planted for getting oils. From the chemical point of view, all the natural diversity of vegetable oils is characterized by the fatty acid composition of triglycerides, and the diversity of diesel biofuels by the fatty acid composition of monoesters. Samples of canola, mustard, grape, and radish oil obtained from seeds by cold pressing have been experimentally studied. Diesel fuel samples have been produced by transesterification with methanol in presence of alkali. Fatty oil compositions have been determined with gas liquid capillary chromatography. The samples studied mainly distinguish by a proportion of oleic, linoleic, linolenic, and erucic acids, the total amount of which compose about 90% of each sample. The following properties have been measured for oil 4 samples and 4 biodiesel fuel samples: enthalpies of combustion with a bomb calorimeter, flash points, cloud points, densities and viscosities in the range 283.15 - 350.15 K. The relation between those properties and fatty acid composition have been established that allows us to propose a method for prediction of biodiesel fuel properties based on their fatty acid compositions.