Hydrodeoxygenation of pure soybean oil, waste cooking oil and purified oil for production of hydrotreated biodiesel (HBD)

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Hydrotreating of natural triglycerides is a promising technology to produce renewable diesel whose components are very similar to those of petroleum diesel. In this work, conversion and paraffin content of hydrotreated biodiesel (HBD) obtained from various feedstocks were compared. The gas compositions were characterized by refined gas analysis-gas chromatography (RGA-GC). The conversion was calculated with simulated distillation-GC, the paraffin content was calculated with GC-FID. The conversion of HBD from pure soybean oil was ~ 90 % while the conversion of HBD from the waste cooking oil was 40 %. When the waste cooking oil was purified by supercritical CO_2 and was used as the raw materials, the conversion was increased up to 80 %. Detailed liquid compositions of HBD from the various raw materials were analyzed by GC-MS and the ratio of O/C and H/C were measured to evaluate energy content of the products.