Title: Study on the glycerolysis reaction of high free fatty acid oils for use as biodiesel feedstock

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Abstract: Biodiesel is the main alternative to fossil diesel and it may be produced from different feedstocks such as semi-refined vegetable oils, waste frying oils or animal fats. However, these feedstocks usually contain significant amounts of free fatty acids (FFA) that make them inadequate for the direct base catalyzed transesterification reaction (where the FFA content should be lower than 4%). The present work describes a possible method for the pre-treatment of oils with a high content of FFA (20 to 50%) by esterification with glycerol. In order to reduce the FFA content, the reaction between these FFA and an esterification agent is carried out before the transesterification reaction. The reaction kinetics was studied in terms of its main factors such astemperature, % of glycerin excess, % of catalyst used, stirring velocity and type of catalyst used. The results showed that glycerolysis is a promising pretreatment to acidic oils or fats (> 20%) as they led to the production of an intermediary material with a low content of FFA that can be used directly in thetransesterification reaction for the production of biodiesel. (C) 2011 Elsevier B.V. All rights reserved.

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