A Process for the Production of Biodiesel from Non Conventional Sources

P. Bondioli, L.Della Bella, Stazione Sperimentale Oli e Grassi, via G.Colombo 79, 20133 Milano, Italy

N. Ravasio, F.Zaccheria, CNR –ISTM and University of Milano, via G.Venezian 21, 20133 Milano, Italy

One of the most important barrier for the diffusion of biodiesel consists on the price of starting material. Vegetable oils, that commonly are used as a feedstock for biodiesel production are responsible for more than 80 % of the total biodiesel production costs. The research for the individuation of alternative feedstock began more or less at the same time as biodiesel processing one. During the time used frying oils as well as animal fats or other non conventional oils were studied to assess their aptitude for biodiesel preparation. Apart from the different biodiesel quality that can be obtained using alternative feedstocks, that often obliges to prepare biodiesel blends in order to fulfil international standards such as EN 14214 or ASTM D 6751, the problem of a very bad quality glycerol by-product still remains as an heavy stone on the economical balance of biodiesel production.

The paper we are presenting here is a description of a process that, starting from a mixture of high iodine value (IV) fatty acids, allows the preparation of a good quality biodiesel[1]. The process consists of a direct esterification step followed by a selective hydrogenation reaction, allowing the reduction of IV and contemporarily avoiding almost quantitatively the formation of saturated fatty acids. Due to this selectivity the hydrogenation treatment greatly improves the oxidative stability of the methylester while keeping its cold properties

With this process the high IV fatty acids are converted in a good quality biodiesel and the final product can fulfill standard parameters requirement. Finally the presented process, such as all direct esterification processes, does not generate glycerol as a co-product, making the total economy lighter and independent from the critical marketing of this polyalcohol.

[1] Bondioli, P.; Ravasio, N.; Zaccheria, F.; Dom. Ital. Brev. nr. MI2005A000723 (21/04/2005); PCT/IT2006/000258 (18/04/2006)