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Production of biodiesel from animal fat using supercritical ethanol

David Bolonio^{1,2}, Philipp Marco Neu¹, Sigurd Schober¹, Martin Mittelbach¹ and Laureano Canoira²

¹University of Graz, Austria

²Universidad Politécnica de Madrid, Spain

Biodiesel is currently produced from a catalytic transesterification reaction of various types of edible and non-edible oil with methanol. The use of waste animal tallow instead of edible oils opens a route to recycle this waste. This material has the advantage of lower costs but the problem of high content of free fatty acids, becoming necessary a pre-esterification reaction that increases the cost of the catalytic process. The production of biodiesel using supercritical alcohols is appropriate for materials with high acidity and water content, therefore the use of this process with animal fat is a promising alternative. Ethanol has been used because it can be produced from biomass via fermentation resulting in a complete renewable biodiesel, instead of methanol that derives from fossil feedstocks. Two different processes have been studied: first, the direct transesterification of animal fat using supercritical ethanol and second a two-step process where the first step is a hydrolysis of the animal fat and the second step is the esterification of the resulting fatty acids. The temperature, the molar ratio ethanol:fat and the time have been modified in the different reactions to study the effect in the final conversion and the degradation of the unsaturated fatty acid esters, main inconvenient of these high temperature and pressure processes.

Biography

David Bolonio is in his second year of the PhD. He studied Mining Engineer and the Master in Environmental Research, Modeling and Risk Assessment in the Universidad Politécnica de Madrid. He has done a research stay at the Faculty of Chemistry in the University of Graz, has attended four conferences presenting his research works and has three papers in high impact journals.

david.bolonio@upm.es

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