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SYNTHESIS OF RENEWABLE FUELS: CROSS-METATHESIS DEGRADATION OF INDUSTRIAL RUBBER WITH MICROALGAE OILS

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RESUMEN

Nowadays, biofuels are very attractive due to they make possible the reduction of all gaseous emissions, including the greenhouse gases (GHG) CO_2 and CH_4, which are responsible for climate change and global warming. Typically, biodiesel has been prepared using oleaginous crops such as rapeseed, soybean, sunflower, and palm. Notwithstanding these, microalgae have shown some advantages and have been considered a more suitable feedstock. They have a fast growth rate, permit the use of non-arable land, their production is not seasonal, marine or wastewater can be used for the culture, and biomass can be harvested daily. Therefore, trains that contain high amounts of oil such as *Chlorella* sp., *Neochloris oleoabundans*, *Nannochloropsis* sp., *Scenedesmus obliquus*, and *Dunaliella tertiolecta* have been cultivated in order to generate biofuels for transportation. In this sense, our research group is working on the development of the next generation of biofuels, considering that, molecules and compounds with double carbon bond [C=C] such as olefins, natural or industrial rubbers, and oils can undergo metathesis. Thus, biofuels were synthesized by *cross*-metathesis degradation of industrial rubber with microalgae oil using Ru-alkylidene catalysts. Thus, the freshwater microalgae *Chlorella* sp. and the *Neochloris oleoabundans* strain adapted to seawater were cultivated. Next to this, fatty acid methyl ester were extracted and used simultaneous as a green solvent and chain transfer agent (CAT) to control the molecular weight. The renewable biofuels obtained are a diesel/biodiesel blend constituted by low molecular-weight hydrocarbons and FAME whose composition and molecular weight (M_n=10^2) were determined by GC/MS(EI) and SEC, respectively. It is noteworthy that the industrial rubber used in this work represents "a model" of industrial rubber.

Keywords: *microalgae oil, industrial rubber, metathesis, controlled degradation.*