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**Research Abstracts** 

## Synthesis of biofuels Via Cross-Metathesis Degradation of Waste Industrial Rubber With Microalgae oils.

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**Abstract:** Biofuels were synthesize via cross-metathesis degradation of the SBR, using microalgae oils as Chain Transfer Agent (CTA) and green solvent; followed by transesterification reaction. The microalgae strains *Neochloris oleoabundans* (UTEX LB 1186, was adapted to marine water) and *Chlorella sp.* (freshwater) were grown with continuous aeration, at  $23^{\circ}$ C ( $\pm 1^{\circ}$ C), pH= 7.7-8.5, light intensity of 3300 luxes and photoperiod 12h. Biomass was harvested by centrifugation. Microalgae oils were obtained by solvent extraction and used it in cross-metathesis degradation of SBR with Ru-alkylidene and Ru-vinylidene catalysts. Afterwards, in the same reactor, transesterification was carried out. SBR (molecular weight initial Mn=1.3x105; PDI=1.3) was degraded to oligomers at molecular weight Mn=10<sup>3</sup>, and yield above 90% using Ru-alkylidene catalyst. However, with Ru-vinylidene catalyst, the yield decreased at 60-70%. After that, the oligomers were transesterified with high yield to biofuels with molecular weight Mn=10<sup>2</sup>. Biofuels obtained are a mixture of biodiesel (methyl esters) and diesel (hydrocarbons of low molecular weight), and molecular weight similar at biodiesel obtained only microalgae oils. Other properties similar between the biofuels obtained and the biodiesel are density (g/mL), kinematic viscosity, 25°C (m2/s), Iodine value and cetane number 0.87, 5.21, 96, 50 and 0.85, 5.01, 97, 46; respectively.

Keywords: Biofuels, waste rubber, microalgae oils

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