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Evaluation of methylic and ethylic biodiesels from Pequi oil (*Caryocar brasiliense* Camb.) as possible diesel substituents

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This work describes the synthesis of methylic (MPB) and ethylic (EPB) biodiesels from Pequi oil, employing transesterification via alkaline homogeneous catalysis. Thermogravimetric studies helped to evaluate their chemical stability of these biodiesels in relation to conventional diesel. Ethylic biodiesel originated from a methanol/ethanol 20:80 (w/w) solution, which allowed for direct optimization of the biodiesel-glycerin phase separation.

The Pequi oil used in this study presented the following properties: acidity index = (2.160 ± 0.150) mg of KOH/g of oil; density at 20° C = (905.504 ± 0.722) kg/m³; kinematic viscosity at 40° C = (34.935 ± 1.009) mm²/s; oxidative stability at 110° C = (14.455 ± 0.305) h; refractive index at 40° C = 1.4652 ± 0.0002 .

Gas chromatography-mass spectrometry (GC-MS), infrared spectroscopy (FT-IR), and proton nuclear magnetic resonance (1H-NMR) aided characterization of the biodiesel samples. The thermal degradation of Pequi biodiesels was investigated by thermogravimetric analysis (TGA).

TG analysis indicated that the oxidizing atmosphere reduced the energy barrier necessary for the thermal degradation of EPB. Comparison of the degradation kinetics of both types of biodiesel showed that EBP possessed the highest Ea for both atmospheres studied here (inert and oxidizing). Hence, EPB is a good substituent for the most frequently used mineral diesel fuel, due to its greater thermal stability.

Biography

Marcelo Firmino de Oliveira has completed his PhD in analytical chemistry at the age of 30 years from Universidade Estadual Paulista – Instituto de Química, Brazil. He is a Professor of Analytical Chemistry at Universidade de São Paulo – Departamento de Química - FFCLRP, Brazil. He has published 50 papers in reputed journals. His workgroup has four master students and four doctoral students.

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