



INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

Crude Coconut Oil for Biodiesel Synthesis

G. S. Araújo ^a, R. H. R. Carvalho ^b, E. M. B. D. de Sousa ^c

a. Universidade Federal do Rio Grande do Norte, Natal, giselleufrn@hotmail.com

b. Universidade Federal do Rio Grande do Norte, Natal, rique@eq.ufrn.br

c. Universidade Federal do Rio Grande do Norte, Natal, elisa@eq.ufrn.br

Abstract

Biodiesel production has become an attractive process, aimed at stimulating the production of alternative fuels. This study presents the results of biodiesel produced from coconut oil (*Cocos nucifera* L.), using acid catalysis (with H_2SO_4), followed by basic catalysis (with NaOH). A 1L jacketed pyrex glass reactor with 3 outlets was used. A mechanical agitator, thermocouple and bath for thermostat regulated refrigeration were introduced. The analysis of oil composition was carried out by gas chromatography and esters compounds were identified. The effect of oil/alcohol molar ratio, reaction time, and temperature on conversion was assessed using experimental 2^3 planning with a central point, in triplicate, for the route analyzed. The molar ratio variable had the greatest effect according to statistical planning analysis. The maximum conversion reached was 85.3% for a molar ratio of 1:6, temperature of 60°C and reaction time of 90 minutes. The Coconut oil was characterized by their physical and chemical properties and key constituents in the oil. The lauric acid was its main component and even showed high acidity. The biodiesel produced was characterized by its main physicochemical properties that had very satisfactory results when compared with the standard values from the National Petroleum Agency.

Keywords: Biodiesel, catalysis, Cocos nucifera, crude oil, coconut.
