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Analysis of biodiesel produced from residual oil of fishing industry.

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Abstract – As a result of the low cost of biodiesel from waste oils, it is interesting to evaluate their production in laboratory scale for research on the ideal route for producing and evaluating the quality of the final product. In this sense, was a biodiesel produced from residual fat of fish through the process of hydroesterification. This process was conducted at a temperature of 300 ℃ for hydrolysis, followed by a reaction of esterification to 200 ° C. For the reaction of esterification were used 15% of niobium oxide in pellet (Nb2O5) as a catalyst and methanol in a molar ratio, fatty acid: methanol, 1:3. In preliminary results obtained a conversion of up to 91.21% indicating the potential use of residual fat of fish in the production of biodiesel

Biodiesel, an alternative diesel fuel, is made from renewable biological sources such as vegetable oils and animal fats. It is biodegradable, nontoxic and is so environmentally beneficial.

The hydroesterification is the most modern alternative process in biodiesel production. This process allows the use of any raw material grease. These materials are processed into biodiesel independent of acidity and moisture they hold.

In the hydrolysis of residual fat fishing any kind of catalyst was added because the sample had water in excess. In the esterification, fatty acid of residual fish, methanol in determined molar ratio and x% of catalyst were used. The catalyst was previously treated at 120 °C for 1 hour. In both reactions agitation (500rpm) and temperature were kept constant [1 e 2] and were evaluated according to the index of acidity (%) of the sample aliquots removed at times 5, 10, 15, 20, 25, 30, 45 and 60 minutes, according to AOCS Ca 5a-40. The product was directly subjected to drying for the removal of residual water and methanol. After esterification, it was necessary to use a simple vacuum distillation process of the biodiesel produced to separate it from solid waste contained in the raw material used.

According to the results presented in Table 1, residual fat of fish shows a potential raw material for production quality biodiesel. Moreover, adding value to reject making a co-product, thus minimizing their impact on the environment.

Table 1: DISTILLATE BIODIESEL CHARACTERISTICS

CHARACTERISTICS	RESULTS	METHOD	ANP RESOLUTION N°7	
			MÍN.	MÁX.
Corrected Flash Point	112 ºC	ASTM D 93	100	
Kinematic Viscosity at 40ºC	5, 5619 mm² / s	ASTM D 445	3	6
Sulphated Ash, % (m/m)	0,01 %	ASTM D 874		0.02
Ester Content, % (m/m)	93,60%	EN 14103	96,5	
Free Glycerol, %(m/m)	0,01 %	ASTM D 6584		0.02
Total Glycerol, % (m/m)	0,09 %	ASTM D 6584		0.38
Cold Filter Plugging Point	9 °C	ASTM D 6371		19
Density at 20°C	879 kg/m³	ASTM D 1298	850	900
Monoglyceride Content, %(m/m)	0,19 %	ASTM D 6584		Anotar
Diglyceride Content, % (m/m)	0 %	ASTM D 6584		Anotar
Triglyceride Content, % (m/m)	0,01 %	ASTM D 6584		Anotar
Oxidation Stability Indc. Period	> 6h	EN 14112	6	
Corrected Flash Point	112 ºC	ASTM D 93	100	

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