INFLUENCE OF TEMPERATURE IN RHEOLOGICAL PROPERTIES OF BOVINE FAT – ALTERNATIVE SOURCE FOR BIODIESEL PRODUCTION

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One of the largest commercial bovine flocks in the world is Brazilian. The beef tallow, a by-product of the livestock industry has been valued in Brazil since 2007, with the Brazilian National Biodiesel Program. The bovine fat is the second source for the production of biodiesel in the country, second only to soybean oil. The use of this by-product in the production of biodiesel is beneficial as far as it gathers value to the product, and for allocating to the energy from a pollutant waste. Biodiesel is a biodegradable fuel produced from renewable sources such as animal fats or vegetable oils, which undergo a transesterfication reaction by an alcohol in the presence of a catalyst. The rheological characterization of these raw materials is essential in the dimensioning of equipment and processes to a more efficient and profitable achievement of the biodiesel. Thus, the rheological behavior of bovine fat was measured at temperatures between 331 K and 367 K using a rheometer AR-2000EX (*TA Instruments*), using geometry of concentric cylinders and ramps of increasing strain rate from 1 to 1000 s-1. Curves of flow were obtained and fitted to the models of Newton, Bingham, Herschel-Bulkley and Power Law, which the latter is the best fit (R^2 = 0,999). The fluid presents pseudoplastic behavior, flow behavior index n <1. The consistency index (k) decreases with increasing temperature and this influence was evaluated by an equation of Ahrrenius (R^2= 0.952), obtaining an activation energy of 20.067 kJ / mol • K.

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