A COMPARATIVE STUDY OF HYDROCAVITATION AND ULTRASOUND ASSISTED BIODIESEL PRODUCTION

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Most of the existing studies regarding the alkali catalyzed methanolysis and ethanolysis of vegetable or waste oils focus on investigation and optimization of process variables, namely, oil to alcohol ratio, catalyst concentration, reaction temperature[1,2]. The purpose of this paper was to study the production of biodiesel in continuous flow assisted processes, specifically a comparison between hydrocavitation and ultrasound assisted processes.

When using a high intensity ultrasonic processor, the increase in either reaction time or ultrasonic intensity amplitude, leads to higher yields as the driving force is the acoustic cavitation phenomena, while the hydrodynamic cavitation process depends on the balance between cavitation assisted process, which is favored at lower temperatures, and conventional process, the increased mixing of the reactants leads to an increase in temperature which is detrimental to the manifestation of the cavitation effect and to the formation of cavitation bubbles[3]. Increasing the reaction time leads to the heating up of the reactants to a point where the generation and impact of cavitation is less significant. Specific energy consumption for each type of assisted process was calculated and compared as well.

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