



Simulation of biodiesel production from PFAD using a reactive distillation

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Biodiesel is an alternative fuel that is produced from transesterification of pure vegetable oil and methanol in the presence of basic catalyst. However, biodiesel production from palm fatty acid distillate (PFAD) is preferred because it is a byproduct from the extraction of palm oil. Palm fatty acid distillate contains high free fatty acids contents and moisture. Therefore, a large number of unit operations for two – steps catalyzed process such as two reactors, a decanter, three distillation columns, heaters and coolers are required. This research proposes a single step catalyzed process using a reactive distillation. The effects of parameters such as distillate rate, reflux ratio, and feed location of the reactive distillation and other unit operations are performed by using a process simulator. The results show that the two – steps catalyzed process requires large reactor volume and high energy consumption for biodiesel separation. While completed conversion of the reactive distillation process is carried out. Mass fraction of biodiesel in product stream is 0.9965 when a few number of unit operations are used for the separation process.

Keywords: Biodiesel production; Palm fatty acid distillate; Reactive distillation; Process simulation