RECOMMENDATIONS

1. Type of catalyst in the reactive distillation is not only homogeneous but also heterogeneous catalyst. Therefore, the firstly recommendation is to apply the heterogeneous catalyst in to the biodiesel processing. This catalyst has many advantages such as prevent soap formation, easy to reuse again and high yield. The kinetic of this catalyst can be introduced to calculation in the ASPEN PLUS by writing Fortran language of reaction part. This step proposes the alternative way to produce biodiesel.

2. In this work, the objectives only focus on the conversion between conventional and reactive distillation process. However, the capital investment and operation cost also should be considered because there are some researcher who proposed the highly capital cost of reactive distillation. The cost of reactor and distillation can be reduced. However, mainly cost of reactive distillation is the column cost. The calculation can be investigated by ASPEN ICARUS.

3. In addition, the effects of reactive distillation processing on environmental should be investigated. The Life Cycle Assessment (LCA) is introduced to indicate the correlation of environmental impact and to have a suitable management process in order to reduce the hazardous effect to humans and the environment.

4. The heat integration of process can be determined by computing the minimum usage of heating and cooling utilities. Moreover, the number of heat exchanges can be reduced by breaking the heat loops. These calculations can be performed by ASPEN PINCH.

5. In this research, only controllability of feed disturbances was considered. The plantwide process control should also investigate to provide an economic advantage by enabling closer operation to optimization constraints, decreasing the number of shut-downs and by reducing the amount of off-specification products.

6. In this work, raw material was just assumed triglyceride group. The other components such as water, sulfur and free fatty acid were neglected. However, these components affecting on the conversion should be added to the calculation.