

Sadudee Bundithum 2011: Material Balance, Scheduling and Cost Evaluation of Commercial Biodiesel Plant from Palm Oil. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Associate Professor Penjit Srinopakun, Ph.D. 227 pages.

In this present work, four biodiesel production plants with capacities of 100,000; 300,000 and 500,000 kg/batch were investigated. The plants employed batch process with potassium hydroxide and palm stearin as catalyst and feedstock, respectively. Simulation of the belonging processes was performed under Aspen Batch Process Developer software. The condition of transesterification of palm stearin to methyl ester was as following; concentration of potassium hydroxide 0.5%, molar ratio of methanol to oil 6:1, reaction temperature at 60 °C and reaction time of 1 hour.

Additionally, settling time for 6 hours was pursued after the completion of reaction. The difference of each process model (plant A to D) was sizing and number of equipment was varies. Each process was simulated in order to optimize the operation time which had an effect on productivity of biodiesel production. After that, the economic cost was analyzed to evaluate the investment and operating cost.

From the results of schedule simulation, the plant A and 500,000 kg/batch feedstock capacity of fixed time revealed the suitable for schedule time, investment cost and operating cost.

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