

Thesis Title	The Evaluation of Energy and Economic of Ethanol Production.
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Abstract

This thesis is to study the energy and economic of anhydrous and cost of each production step. The production process consists of 3 steps, namely fermentation, distillation and dehydration. The last process is discussed and compared between azeotrope distillation and pervaporation.

Fermentation in this study uses molasses as raw material and use *Saccharomyces cerevisiae* as yeast. The process yields ethanol 8 – 10% by volume. The cost of this process is 8.12 Baht/litre (ethanol 10% vol.) including the cost of raw material. The energy used in this process is 0.033 MJ/litre (ethanol 10% vol.). The cost can separated into 2 part, namely 6.68 Baht/litre (ethanol 10% vol.) and 1.44 Baht/litre for the fermentation process (ethanol 10% vol.). Another process is distillation to increase the concentration of ethanol up to 95% by volume. This process employs 2 distillation towers for ethanol evaporation and condensation. Energy of 9.5 MJ/litre (ethanol 95% vol.) is used in this process and the cost is 2.30 Baht/litre (ethanol 95% vol.) without raw material. One of the final process, azeotrope distillation, uses chemical substance to separate water in the ethanol from the concentration 95% up to 99.5% by volume and energy used is 0.75 MJ/litre (ethanol 99.5% vol). The azeotrope distillation cost is 2.13 Baht/litre (ethanol 99.5% vol) without raw material. Another one, pervaporation process, uses membrane to separate water from ethanol. The process increases the ethanol concentration to 99.5% by volume. This process uses 0.29 MJ/litre (ethanol 99.5% vol) of energy and costs 0.54 Baht/l (ethanol 99.5% vol).