PRODUCING ABSOLUTE ETHANOL BY DISTILLATION AND ADSORPTION USING MOLECULAR SIEVE 3A

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Abstract

Depletion of world fossil fuel reserves has an impact on the threat of a global energy crisis. The research and development of ethanol as an alternative renewable fuel to be one alternative settlement of this problem. The objective of this study is to study the effect of reflux ratio and feed temperature on energy use in distillation columns, along with the optimum adsorption time using molecular sieve 3A in the fixed-bed separator. This research method using a continuous distillation system with 8 trays. Feed used is ethanol-water 10% v/v and fermented molasses with ethanol levels of 11% v/v. Experiments carried out by preparing a water-ethanol 10% v/v and fermented molasses in fermentation for 66 hours for anaerobes. Drain water through the condenser and adjust the temperature according to the variable feed (30°C; 40°C; 50°C, and 60°C) with each RR (1,5; 2; 2,5; 3). Then record the temperature in the top column, the measured levels of ethanol use alcoholmeter and record volume. Distillate then flows into the adsorption column to raise the levels to be absolute. The results of the study the most optimum reflux ratio is shown in 3 and feed temperature 60°C, with levels of distillate 78.2% v/v and the energy consumption of 8192.4 kJ / kg distillate. In the process of adsorption obtained a
maximum ethanol content of 99.7% v/v with a breakthrough time 10 minutes.

Key words: ethanol absolute, distillation, adsorption, molecular sieve