

Sarun Tubslingkra 2014: Separation of Toluene from Heptane via Liquid-liquid Extraction by Using a Microtube. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Assistant Professor Attasak Jaree, Ph.D. 137 pages.

A separation of toluene from heptane via liquid-liquid extraction was studied by using microtube. Effects of contact time (2-10 s), extraction temperature (30-60 °C) and solvent to feed molar ratio (1:1-5:1) were investigated. The experimental design was performed using full factorial experiments. The results were analyzed using MINITAB with the significance level of 95%. The regression model via full quadratic model was proposed for the prediction of percentage extraction from the specified operating conditions. We compared the equilibrium time between stirred batch reactor and microtube and scale-up of toluene extraction by using microtube. The results shown that equilibrium time of the extraction by using the microtube and stirred batch reactor was 2 and 90 to 180 minutes, respectively. The equilibrium time of the extraction by using microtube approximately 2700 to 3600 times faster than using the stirred batch reactor. The optimal operating conditions provide percentage extraction of 60.85% were as follows: the contact time of 2 s, the extraction temperature of 60 °C and the solvent to feed molar ratio of 5:1.

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Thesis Advisor's signature