

Kittisak Phongpisitsan 2006: Extraction of Active Ingredients from *Andrographis Paniculata* Using Ethyl Alcohol. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Associate Professor Phungphai Phanwadee, D.Sc. 80 pages.  
ISBN 974-16-1905-7

This study involves extraction of active ingredients from *Andrographis Paniculata* or Fahtalaichone. The raw material was crushed dried leaves and stems of Fahtalaichone (averaged particle size of 0.09 mm.), and the solvents were 85% and 95% ethyl alcohol. Comparison of the percentage yields of extracted andrographolide, a major active ingredient, using the ratios of the raw material to ethyl alcohol of 1:16 by weight showed that 85% ethyl alcohol is a better solvent. The 85% ethyl alcohol gives 98 percent yield while 95% ethyl alcohol gives 83 percent percent yield. When the ratios of the raw material to 85% ethyl alcohol are 1:5 and 1:10, the yields are 77 and 95 percent, respectively. The two stage extraction at the ratio of raw material to 85% ethyl alcohol of 1:5 gives 96 percent yield which is very close to that obtained from using the ratio of 1:10 in a one stage operation in which the same total amount of solvent was used. A 50-litre stirred tank with a side-entering 45° pitched blade turbine and a 15° off-centre angle of the shaft was used in a pre-pilot scale extraction. The extraction experiments using 85% ethyl alcohol with the ratios of the raw material to the solvent of 1:5 and 1:10 and the agitator speeds ranging from 560 to 1120 rpm showed that the extraction rate does not depend on the agitator speed and the extraction reached equilibrium within 6 operating hours.

---

Student's signature

---

Thesis Advisor's signature

\_\_\_\_/\_\_\_\_/\_\_\_\_