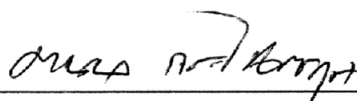


Kesinee Srisura 2006: Extraction of Vitamin E from Sunflower Seeds Using Supercritical Carbon Dioxide and Precipitation of Vitamin E Using Dense Carbon Dioxide. Master of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Assistant Professor Manop Charoenchaitrakool, Ph.D. 115 pages. ISBN 974-16-2847-1

The aim of this study was to extract vitamin E (α -tocopherol) from sunflower seeds using conventional extraction and supercritical carbon dioxide. The sample was ground and was in the size range of 425-600 μm . In the study of supercritical carbon dioxide extraction, the effects of extraction pressure and temperature on the yield were investigated. The experiments were conducted at the pressure range of 130-170 bar and the temperature ranging from 35 to 45 $^{\circ}\text{C}$, carbon dioxide flow rate of 0.5 mL/min. It was found that an increase in the extraction pressure resulted in a higher amount of oil extracted. However, the amount of alpha-tocopherol extracted was decreased as the pressure increased. In addition, an increase in the extraction temperature did not improve the extraction yield significantly. In this study, the highest amount of alpha-tocopherol extracted was 2.52 mg per 100 g of sunflower seed when using the extraction pressure of 130 bar, temperature of 40 $^{\circ}\text{C}$ and 500 mL of carbon dioxide. When adding ethanol as a co-solvent, the extraction was improved by 1.3 times. In the conventional extraction using a hot plate with the speed of 400-500 rpm, temperature of 50 $^{\circ}\text{C}$, extraction time of 7 hours and ethanol as a solvent, the highest amount of alpha-tocopherol extracted was obtained to be 25.13 mg per 100 g of sunflower seed. The low amount of alpha-tocopherol extracted in this study could be due to the low solubility of alpha-tocopherol in the supercritical carbon dioxide within the range of operating conditions studied. In the precipitation of alpha-tocopherol from ethanol using the GAS technique, the highest amount of alpha-tocopherol precipitated was found to be 17.56 mg per 100 g of sunflower seed when using carbon dioxide as an anti-solvent with the flow rate of 5 mL/min at 25 $^{\circ}\text{C}$.

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Student's signature



Thesis Advisor's signature

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