

## Optimization of Soybean Oil by Modified Supercritical Carbon Dioxide

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**Abstract :** The content of omega-3 in soybean oil is important in the development of infants and is an alternative for the omega-3 in fish oils. The investigation of extraction of soybean oil is needed to obtain the bioactive compound in the extract. Supercritical carbon dioxide extraction is modern and green technology to extract herbs and plants to obtain high quality extract due to high diffusivity and solubility of the solvent. The aim of this study was to obtain the optimum condition of soybean oil extraction by modified supercritical carbon dioxide. The soybean oil was extracted by using modified supercritical carbon dioxide (SC-CO<sub>2</sub>) under the temperatures of 40, 60, 80 °C, pressures of 150, 250, 350 Bar, and constant flow-rate of 10 g/min as the parameters of extraction processes. An experimental design was performed in order to optimize three important parameters of SC-CO<sub>2</sub> extraction which are pressure (X<sub>1</sub>), temperature (X<sub>2</sub>) to achieve optimum yields of soybean oil. Box Behnken Design was applied for experimental design. From the optimization process, the optimum condition of extraction of soybean oil was obtained at pressure 338 Bar and temperature 80 °C with oil yield of 2.713 g. Effect of pressure is significant on the extraction of soybean oil by modified supercritical carbon dioxide. Increasing of pressure will increase the oil yield of soybean oil.

**Keywords :** soybean oil, SC-CO<sub>2</sub> extraction, yield, optimization

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