

ABSTRACT

Modelling of Supercritical Carbon Dioxide Extraction of Peanut Oil in Fixed Beds

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Supercritical Carbon dioxide (SC-CO₂) extraction of oil from peanuts is an alternative to hexane extraction or mechanical expression. The effects of temperature ranging from 40° – 80°C and pressure ranging from 200 – 550 bars on oil yield using SC-CO₂ in a vertical fixed bed batch extractor containing broken roasted peanut pieces having a mean characteristic length of 0.861mm was studied.

In the range of temperature and pressure used, the highest values of each gave the highest oil yield. Above about 360 bars, increasing the temperature significantly improved the extraction rate, whereas below 300 bars increasing the temperature reduced the extraction rate.

Various mathematical models were used to describe the oil extraction. Kinetics and equations are presented together with an evaluation of their applicability of fit.

Keywords: Anthony Banfield; extraction of oil from peanuts; supercritical carbon dioxide extraction.