

The Effect of Supercritical Carbon Dioxide Process Variables on The Recovery of Extracts from Bentong Ginger: Study on Process Variables

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Abstract : Ginger extracts (*Zingiber officinale* Rosc.) have been attributed therapeutic properties primarily as antioxidant, anticancer, and anti-inflammatory properties. Conventional extractions including Soxhlet and maceration are commonly used to extract the bioactive compounds from plant material. Nevertheless, high energy consumption and being non-environmentally friendly are the predominant limitations of the conventional extractions method. Herein, green technology, namely supercritical carbon dioxide (scCO₂) extraction, is used to study process variables' effects on extract yields. Herein, green technology, namely supercritical carbon dioxide (scCO₂) extraction, is used to study process variables' effects on extract yields. A pressure (10-30 MPa), temperature (40-60 °C), and median particle size (300-600 µm) were conducted at a CO₂ flow rate of 0.9 ± 0.2 g/min for 120 mins. The highest overall yield was 4.58% obtained by the scCO₂ extraction conditions of 300 bar and 60 °C with 300µm of ginger powder for 120 mins. In comparison, the yield of the extract was increased considerably within a short extraction time. The results show that scCO₂ has a remarkable ability over ginger extract and is a promising technology for extracting bioactive compounds from plant material.

Keywords : conventional, ginger, non-environmentally, supercritical carbon dioxide, technology

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