

Title: Optimization of Supercitical extraction CO_2 of essential oil from neem leaves using response surface methodology

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Neem tree or *Azadirachta Indica* has been proven to give a lot of benefits in medicinal point of view. Each parts of the tree has its own biological activity which could aid in fighting and curing diseases.These biological activities was found to come from the sesquiterpenes compounds that exist in the leaf. The main biological activities of neem leaf are anti-inflammatory and anti-allergy properties. Supercritical carbon dioxide extraction was applied for the extraction of essential oil since it gives higher oil yield and does not require extra unit to separate the solvent used. The optimization of supercritical carbon dioxide extraction is studied and the optimized parameters was 20.25MPa pressure and 319.33K using 0.23mm sample determined through RSM. GCMS analysis is carried out on the essential oil of neem leaves and 43 compounds were identified. 1.06% of sesquiterpenes compound of γ-Elemene and α-Farenesene is found. The major compounds in the extract composed mainly carboxylic acids which is 49.11%. 17.02% of hexadecanoic acid, 31.63% of phytol and 24.2% of 9,12,15-octadecatrienoic acid, (Z,Z,Z)- were also found in the extract. In addition, supercritical carbon dioxide extraction of essential oil from neem leaves has been proven to give higher oil yield (0.6%) compared to hydrodistillaiton technique which can only extracted about 0.1% of the essential oil. Supercritical CO_2 extraction uses environmental friendly solvent such as CO_2 and is recyclable.

Biography

Currently, Suzana Yusup is an Associate Professor at Universiti Teknologi PETRONAS. She graduated from University of Leeds, United Kingdom, in 1992 in Chemical Engineering. She obtained her MSc in Chemical Engineering/Adsorption Technology from University of Wales, Swansea, United Kingdom in 1995 and pursuing her PhD in Chemical Engineering/Powder Technology, University of Bradford, UK from 1995-1998. She has been in academic institution for more than 20 years. Her research interest are biofuel & biochemical and green product and processes. This is a collaboration research between Universiti Teknologi PETRONAS, Bio-X Techno Sdn Bhd, and Agriculture Department of Perak Tengah. The authors would like to thank all those who have contributed for their joint efforts in conducting this research and also to Universiti Teknologi PETRONAS for supporting this work and Elsevier foundation Green and Sustainable Chemistry Challenge for the grant to undertake the research.

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