

Supercritical CO₂ Extraction of Essential Oil from Clove Bud: Effect of Operation Conditions on the Selective Isolation of Eugenol and Eugenyl Acetate

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Z. Naturforsch. **60b**, 1197 – 1201 (2005); received July 14, 2005

The supercritical fluid extraction (SFE) of clove bud essential oil was studied using CO₂ as solvent. The effect of operation conditions was analyzed in a series of experiments at temperatures between 325 and 416 K and pressures between 110 and 190 bar. The collected extracts were analyzed and the relative composition of the essential oil was determined. The optimum condition was found in a temperature of 353 K and at a pressure of 190 bar, minimizing the number of extracts to two compounds (eugenol and eugenyl acetate). The extract obtained from clove bud by using supercritical fluid extraction was compared with the essential oil obtained by steam distillation and microwave-assisted extraction by considering both quantity and quality of the product. The oil yield was higher in steam distillation and microwave oven extraction. In contrast, oil extracted by using SFE contained higher amount of eugenol and eugenyl acetate.

Key words: Clove Bud, Eugenol, Extraction