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Supercritical and High Pressure Subcritical Fluid Extraction

from Lemon Balm (*Melissa officinalis* L., Lamiaceae)

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Abstract

Analysis of yield and composition profile of *Melissa officinalis* (Lemon balm) extract obtained by two step CO₂ extraction at high pressure was analyzed. The first or essential oil fraction, collected at 10 MPa and 40°C, contained mostly the high volatile and aromatic compounds. The second fraction was consequently extracted at 30 MPa using different temperature: 25°C (higher pressure than critical pressure but at temperature below the critical; HPCP-CO₂), 40°C or 100°C (supercritical CO₂; SC-CO₂). Obtained yield of essential oil fraction was 0.45% at 10 MPa, while depending on applied extraction temperature (HPCP-CO₂ or SC-CO₂), the yields of the second fractions collected at 30 MPa varied from 0.44% to 0.94%. Within the study, the content of active substances in obtained extracts was analyzed, too. For comparison with CO₂ extracts (HPCP or SC) the yield and characterization of essential oil obtained by hydrodistillation was accomplished, as well. A significant difference was noted not only between the essential oil isolated by hydrodistillation and SC-CO₂ extraction (40°C, 10 MPa) but also between total extracts obtained by HPCP-CO₂ and SC-

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