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# supercritical-co2-extraction-hemp-seed-oil

Cruising Review

Supercritical CO2 Extraction of Hemp



This webpage QR code

## Structured Data

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This Croatian study investigates the impact of Supercritical Carbon Dioxide (SCCO2) Extraction parameters on the production of hemp seed oil and compares the product to that of oil produced by the Soxhlet method and screw expeller pressing. Industrial hemp has a long history in Croatia having been used in a myriad of products, primarily including food and fiber products. Its recent use has seen a decline because of its association with Cannabis indica L. (marijuana) which is a controlled substance in many countries including the EU.

PDF Version of the webpage (first pages)

<https://cruisingreview.com/smx/supercritical-co2-extraction-hemp-seed-oil.html>

## Supercritical CO<sub>2</sub> Extraction of Hemp Seed Oil

1. This Croatian study investigates the impact of Supercritical Carbon Dioxide (SCCO<sub>2</sub>) Extraction parameters on the production of hemp seed oil and compares the product to that of oil produced by the Soxhlet method and screw expeller pressing.
  2. Industrial hemp has a long history in Croatia having been used in a myriad of products, primarily including food and fiber products. Its recent use has seen a decline because of its association with *Cannabis indica* L. (marijuana) which is a controlled substance in many countries including the EU.
  3. The EU allows production of industrial hemp with THC content of less than 0.2 percent.
  4. Hemp seeds contain, quote – approximately 25-35 percent lipids, 20-25 percent proteins, 20-30 percent carbohydrate, 10-15 percent insoluble fibers and numerous other natural source minerals – unquote.
  5. SCCO<sub>2</sub> is an ideal method for hemp seed oil extraction because it leaves a solventless product and its solvency is selectively tunable based on temperature and pressure.
  6. The first investigation performed in this experiment was to measure the initial oil content in the hemp seeds by solvent extraction using n-hexane for 2.75 hours at 180C.
  7. A second sample of seeds was then pressed using a screw expeller at 60C, 6mm nozzle, and 20 Hz frequency.
  8. The SCCO<sub>2</sub> extractions were carried out at pressures between 300 and 400 bar and temperatures of 40 and 60C using ground hemp seeds.
  9. After extraction at each set of parameters the chlorophyll a, b, and total carotene content was assessed as well as the tocopherol content and fatty acid composition.
  10. Extractions performed at a constant temperature of 40C and pressure of 300 bar produced oil with darker pigmentation and decreasing quantity as the extraction time was increased.
  11. Quote – the initial oil content in the hemp seeds was 33.34+/- 0.23 percent – unquote, as determined by the initial part of the investigation involving the n-hexane extraction. The raw moisture content was measured to be 8.09 percent.
  12. Testing at different pressures indicated that higher pressures yielded extracts with higher pigment content.
  13. Comparing the extracted oil yields from SCCO<sub>2</sub> to the n-hexane extraction and previous studies, it was shown that SCCO<sub>2</sub> is capable of extracting, quote – almost all hemp oil – unquote, available in the seeds.
  14. Tests involving variance of the extraction temperature indicated that increasing temperature from 40C to 60C did not have a significant impact on oil yield.
  15. Extraction temperature was observed to have a significant impact on the concentrations of certain tocopherols in the resulting oil, but not on fatty acid content.
  16. Increased pressure was shown to have a significantly positive effect on the rate of extraction. Higher pressure yielded greater extract volumes given the same time period.
- 4/20/2011 Comparing the extract from SCCO<sub>2</sub> vs that of expeller pressing and n-hexane extraction



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