

1. Cannabis oils, including, quote – the most well-known example of such a product called Simpson oil – unquote, are becoming popular with cancer patients who are self-medicating.
2. The intention of producing cannabis oil is to concentrate the cannabinoids and terpenes into a readily usable form.
3. This study seeks to analyze the components of cannabis oil, including the active cannabinoids, terpenes, and residual solvent content. It does not seek to prove or disprove the health effects of cannabis medication, but rather offer more information regarding the compounds currently being used for self-medication.
4. Other studies have demonstrated that, quote – cannabinoids exert palliative effects in cancer patients by reducing nausea, vomiting and pain, and by stimulating appetite – unquote. Some even tout cannabinoids ability to prevent or cure cancer, but no rigorous study has confirmed these claims.
5. Cannabis oil as defined for this study is a concentrated extract from the flowers or leaves of the cannabis plant produced by solvent extraction.
6. The popular name for cannabis extract, Rick Simpson Oil, comes from a skin cancer survivor named Rick Simpson, quote – who claims to have cured his skin cancer through repeated topical application of Cannabis oil produced according to his own recipe – unquote.
7. The Rick Simpson recipe calls for the use of naphtha or petroleum ether (a petroleum hydrocarbon which is equivalent to diesel or kerosene fuel in some localities) as the solvent for extraction.
8. The cannabis used in this study was a variety known as Bedrocan which has a 19 percent THC content grown in the Netherlands.
9. The solvents tested in this investigation include naphtha, petroleum ether, ethanol, and two different olive oil based methods.
10. As a pretreatment step before extraction the author tested two methods of decarboxylation: a 100 C water bath for 5 minutes and an oven heating method involving 145 C for 30 minutes.
11. A High Pressure Liquid Chromatography (HPLC) investigation of the effectiveness of the two decarboxylation methods indicated that, quote – the mild water bath treatment did not lead to significant changes in the acidic-to-neutral cannabinoid ratio – unquote, while the oven, quote – resulted in a complete decarboxylation – unquote.
12. There was evidence of some undesirable degradation of THC to cannabinol (CBN) in the oven treatment, but only to a minimal extent.
13. Most of the mono terpenes were degraded by both decarboxylation treatments, with some of the sesquiterpenes surviving the water bath. Few terpenes were present after the oven treatment.
14. Do to the degradation of the terpenes during decarboxylation the remainder of the investigations were performed without pretreatment.
15. Of the solvents tested, naphtha produced the least yield while olive oil, quote – especially when using an extended heating time – unquote, extracted and retained the most terpenes.
16. As a real-world comparison, the author also took a sample of Rick Simpson oil produced by a cancer patient using the same variety of cannabis and analyzed for the presence of residual solvents. The patient produced sample contained similar residual solvent at significant concentration.
17. The residual solvent concentration observed in both the lab prepared and patient prepared samples was equal to the overall terpene concentration.
18. While ethanol is a beneficial solvent choice for its low toxicity, it also readily extracts the chlorophyll producing an undesirable flavor in the resulting oil. The author experimented with an activated charcoal filter post-extraction step to remove the chlorophyll but lost approximately half of the cannabinoids and terpenes as a result.
19. Without supporting or rejecting the use of cannabis oil for self-medication, this study indicates that using olive oil as the solvent for extraction has the least toxicity and provides the highest concentration of cannabinoids and terpenes in the final product.

Source: Romano LL, Hazekamp A. Cannabis Oil: chemical evaluation of an upcoming cannabis-based medicine. *Cannabinoids*. 2013;7(1):1-11. https://www.cannabis-med.org/data/pdf/en_2013_01_1.pdf

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