

Marijuana Concentrates

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“Concentrates” refers to a concentrated form of marijuana. There are over 500 chemicals in the marijuana plant and about 80 of those are cannabinoids, or the active ingredients, which also include terpenes (aromas).¹ Concentrate producers harvest these active ingredients from the plant and create a substance made up of only these active ingredients, similar to juicing an orange. Concentrates are usually ingested via inhalation, but can also be ingested orally, such as in an oil or tincture. Concentrated marijuana is often used as an ingredient in infused edible products in the form of oil or butter.

What do concentrates look like?

Concentrates can take the form of oils, butter, or black or brown sticky substances that sometimes have the appearance of wax or glass (sometimes called ‘shatter’).² Regardless of appearance, all these products are the result of harvesting the active ingredients in the marijuana plant.

How are concentrates ingested?

The most common method for consuming marijuana concentrates is via inhalation, either smoking or vaporizing the product. Other methods include adding concentrated marijuana in the form of butter or oil to food products, or ingesting the oil orally by itself.³

Many medical marijuana patients rely on concentrates because they enable them to ingest a large amount of cannabinoids fairly easily. The levels of cannabinoids such as THC and CBD are found in higher levels in concentrates than in the raw plant. For example, THC levels in the raw plant range from about 5-20 percent,⁴ while in concentrates they can range from 50-90 percent.⁵ These high levels might be ideal for patients

seeking relief from debilitating conditions, but can be too much for someone using marijuana as a relaxant or therapeutic agent.

One of the benefits of ingesting marijuana via inhalation is that the consumer can better titrate their dose.⁶ This is also the case with concentrates – inhaling concentrates allows the consumer to more easily titrate their dose than ingesting them orally.

How are concentrates made?

Procuring the active ingredients from the marijuana plant can be achieved through a variety of methods, but there are three main ways that this is accomplished – agitation, temperature and combustion.⁷

Agitation refers to shaking or spinning the plant material until the active ingredients are separated from the plant material. Temperature-based methods use extreme cold to force this separation. With combustible methods, a solvent, usually butane, is used to achieve the separation. Some claim that combustible methods are most effective for creating a concentrate.⁸ However, because there are flammable chemicals used in that process, there is a risk presented to the individual creating the product and those in the vicinity of the process.⁹ Distilling alcohol carries similar risks, which is why it is not allowed in a residence and requires a special license.¹⁰

Recommendations for effective regulation

As with the raw marijuana plant, regulation is a more effective public health approach than prohibition. There are several ways to effectively regulate the manufacturing and consumption of concentrated marijuana.

First, regulations should restrict the use of combustible methods in home production, similar to distilling liquor. Because the chemicals used in this process are flammable, a residence is not an appropriate place for manufacturing. However, also similar to liquor, when done in an appropriate location by a licensed individual, the process of creating concentrates through combustion can be done safely.

Second, a framework should be developed for licensing concentrate manufacturing. This would ensure that concentrates are being manufactured by experienced individuals in appropriate places.

For example, some methods of creating concentrates (agitation and temperature) do not pose the same risks and can be done by almost anybody in a residence without danger.

Next, there is a need for education about the high potency of marijuana concentrates. As mentioned, concentrates can contain up to 90 percent THC, whereas raw marijuana tops out at about 20 percent. Similarly to the differences between consuming wine and liquor, consumers should know that concentrates have a more profound psychoactive effect that can last longer than they are used to.

Finally, it is vital to protect access to concentrates for people who need them, such as medical marijuana patients. For some, the use of concentrated forms of THC and/or CBD are key to their health and sometimes survival.¹¹ Patients must continue to have access to these products.

¹ See, for example, M. A. Elsohly and D. Slade, "Chemical constituents of marijuana: the complex mixture of natural cannabinoids," *Life Sci* 78, no. 5 (2005); Y. Shoyama et al., "Structure and function of 1-tetrahydrocannabinolic acid (THCA) synthase, the enzyme controlling the psychoactivity of *Cannabis sativa*," *J Mol Biol* 423, no. 1 (2012); Z. Fišar, "Phytocannabinoids and endocannabinoids," *Current Drug Abuse Reviews* 2, no. 1 (2009); Ethan B. Russo, "Taming THC: potential cannabis synergy and phytocannabinoid-terpenoid entourage effects," *British Journal of Pharmacology* 163, no. 7 (2011); F. Grotenhermen and K. Müller-Vahl, "The therapeutic potential of cannabis and cannabinoids," *Dtsch Arztebl Int* 109, no. 29-30 (2012); A. T. El-Alfy et al., "Antidepressant-like effect of delta9-tetrahydrocannabinol and other cannabinoids isolated from *Cannabis sativa* L.," *Pharmacol Biochem Behav* 95, no. 4 (2010); Karl W. Hillig, "A chemotaxonomic analysis of terpenoid variation in *Cannabis*," *Biochemical Systematics and Ecology* 32, no. 10 (2004).

² Jonathan P. Caulkins et al., "Considering Marijuana Legalization: Insights for Vermont and Other Jurisdictions," (Santa Monica, CA: RAND Corporation, 2015), 81, http://www.rand.org/pubs/research_reports/RR864.

³ Elemental Wellness, "Understanding Medical Cannabis," (2013); Caulkins et al., "Considering Marijuana Legalization: Insights for Vermont and Other Jurisdictions."

⁴ E. L. Sevigny, "Is today's marijuana more potent simply because it's fresher?," *Drug Test Anal* 5, no. 1 (2013); F. Cascini, C. Aiello, and G. Di Tanna, "Increasing delta-9-

tetrahydrocannabinol (Delta-9-THC) content in herbal cannabis over time: systematic review and meta-analysis," *Curr Drug Abuse Rev* 5, no. 1 (2012); Jennifer McLaren et al., "Cannabis potency and contamination: a review of the literature," *Addiction* 103, no. 7 (2008).

⁵ Tista S Ghosh et al., "Medical Marijuana's Public Health Lessons—Implications for Retail Marijuana in Colorado," *New England Journal of Medicine* 372, no. 11 (2015); Mark E Gerich et al., "Medical Marijuana for Digestive Disorders: High Time to Prescribe&quest," *The American journal of gastroenterology* (2014).

⁶ Arno Hazekamp et al., "The medicinal use of cannabis and cannabinoids—An international cross-sectional survey on administration forms," *Journal of psychoactive drugs* 45, no. 3 (2013).

⁷ Americans for Safe Access, "Guide to using medical cannabis: Cannabis 101," http://www.safeaccessnow.org/using_medical_cannabis.

⁸ *Ibid.*

⁹ Randall Oliver and Edward Stremlow, "Concentrates Issue: Testing for Residual Solvents," *The Northwest Leaf*, May 2, 2013.

¹⁰ U.S. Department of Treasury Alcohol and Tobacco Tax and Trade Bureau, "'Distilled Spirits: Home Distilling'," <http://www.ttb.gov/spirits/home-distilling.shtml>.

¹¹ Americans for Safe Access, "Guide to using medical cannabis: Cannabis 101".