

Medical Marijuana Oversight Committee



Alternative Cannabinoids
August 19, 2024



SOUTH DAKOTA DEPARTMENT OF HEALTH

Diverse Naturally Occurring Compounds in the Cannabis Plant

- The cannabis plant is rich in compounds considered by some to have beneficial health properties.
- Over 500 different terpenes, flavonoids, alkaloids, and cannabinoids have been identified from the cannabis plant.
- Approximately 125 compounds in the cannabis plant have been identified and characterized as cannabinoids.



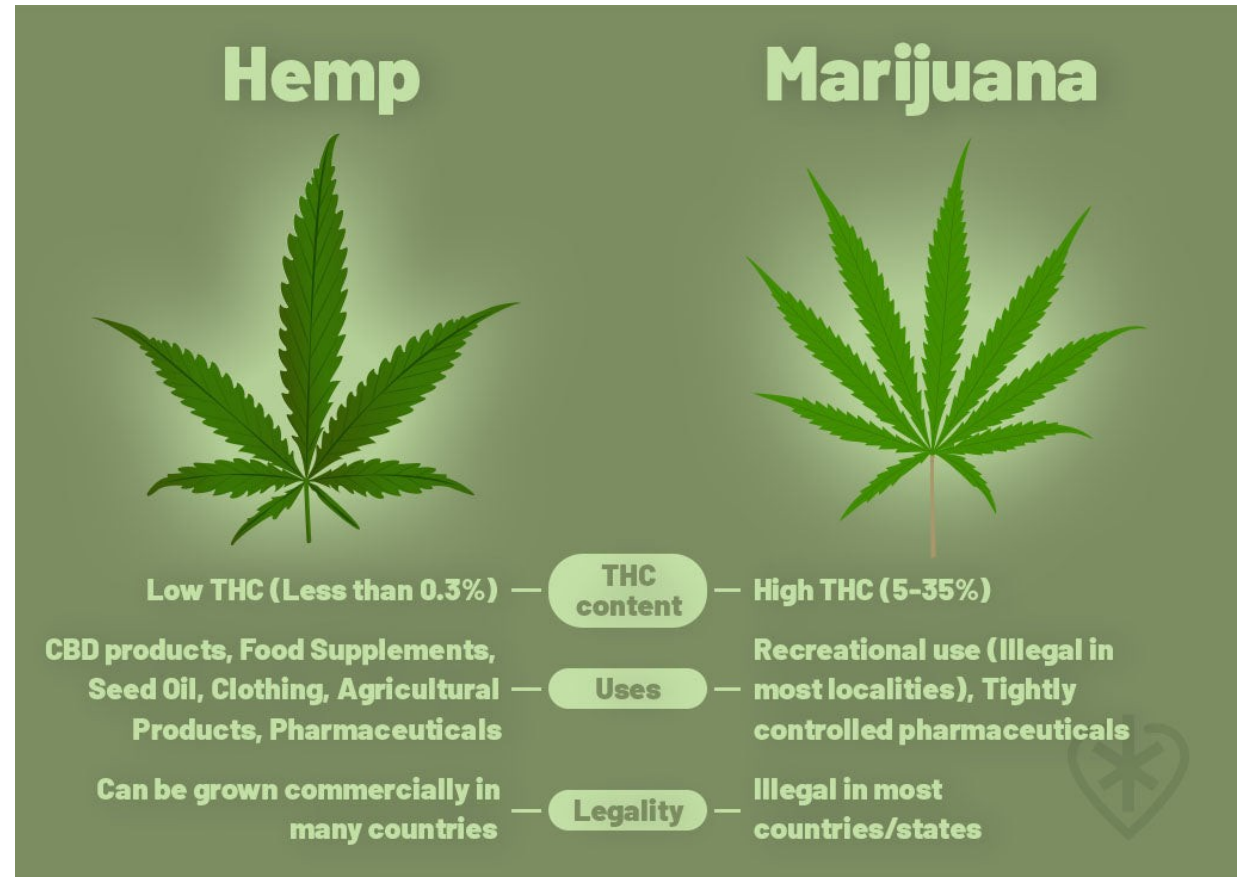
Cannabinoids: More Than Just D9 and CBD!



- Cannabinoids are often characterized as:
 - Psychoactive (or intoxicating) or non-psychoactive
 - Naturally occurring (plant-derived; phytocannabinoid) or chemically-derived (alternative)
 - Terms like semi-synthetic and synthetic are also commonly used to describe cannabinoids

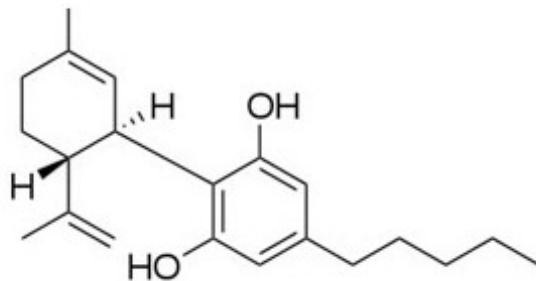
Hemp vs. Marijuana: A Brief Review

- Cannabinoids are found in both hemp and marijuana plants.
- Cannabinoid concentrations in plant tissues vary greatly between hemp and marijuana as well as between strains.
- Cannabis plants can be “engineered” to produce high levels of certain cannabinoids.

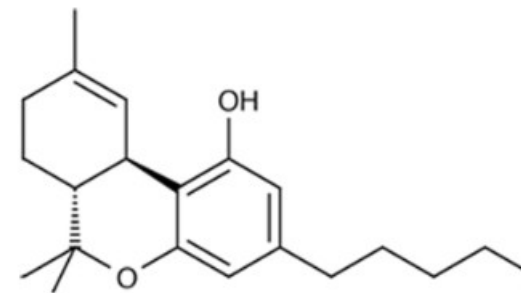


Plant-Derived Cannabinoids: More Than Just CBD and D9

Non-Psychoactive Cannabinoids	Psychoactive Cannabinoids
Cannabidiol (CBD)	Delta-9-tetrahydrocannabinol (D9THC)
Cannabichromene (CBC)	Delta-8-tetrahydrocannabinol (D8THC)
Cannabigerol (CBG)	Delta-10-tetrahydrocannabinol (D10THC)
Cannabidivarin (CBDV)	Cannabinol (CBN)



Cannabidiol

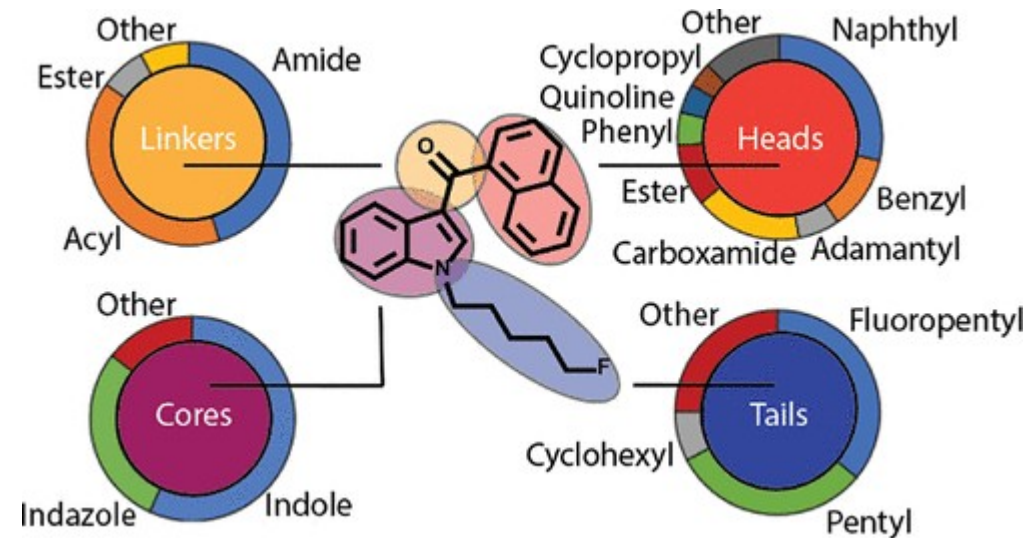


Delta-9-tetrahydrocannabinol

Alternative Cannabinoids: Semi-Synthetic and Synthetic Substances

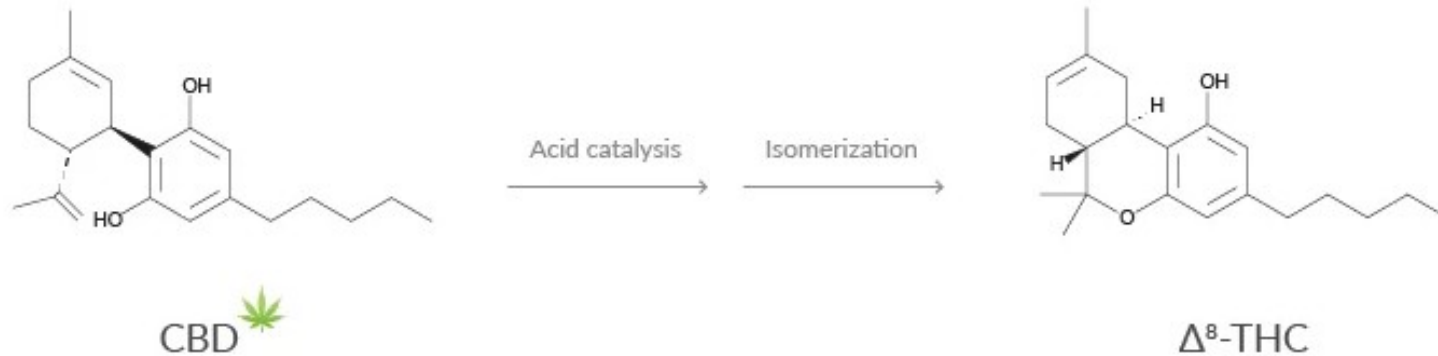
- Semi-Synthetic: a cannabinoid produced by converting a plant-derived precursor into a different substance through chemical reactions.
 - Examples: D8THC and Hexahydrocannabinols (HHCs)
- Synthetic: a cannabinoid or cannabinoid-like substance created through chemical reactions without the use of a plant-derived precursor
 - Examples: K2 and Spice

The Science of Synthetic Cannabinoids



Alternative Cannabinoids: D8THC

- Semi-synthetic D8THC is most often created by chemical modification of cannabidiol (CBD) extracted from hemp.



- D8THC products include edibles and plant material.
- Ingestion and smoking are the most common routes of administration.



Alternative Cannabinoids: THC-O/THC-O Acetate

- THC-Os (Tetrahydrocannabinol acetate esters) are non-natural cannabinoids chemically derived from natural precursors.
- Cannabinoids like D8THC and D9THC can be chemically modified to produce THC-O.
- Smoking is one route of administration for THC-O.
- Upon heating, THC-O breaks down into ketene gas.
- Ketenes are linked to e-cigarette or vaping use-associated lung injury (EVALI).
 - In 2019-2020, EVALI caused over 2,800 hospitalizations and 68 deaths

[Home](#) > [Journal of Medical Toxicology](#) > [Article](#)

Vaping THC-O Acetate: Potential for Another EVALI Epidemic

Research Letter | Published: 12 December 2022

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Alternative Cannabinoids: HHCs

- HHCs (Hexahydrocannabinols) are non-natural cannabinoids chemically derived from natural precursors.
- HHCs include HHC-O (hexahydrocannabinol acetate) and HHC-P (hexahydrocannabiphoral)
- Little is known about HHCs, but they are reported to have similar effects as THC.
- HHC is described as being “stronger” than D8THC but not as “strong” as D9THC.
- HHC is often mixed with or sprayed on substances for consumption.
- Routes of consumption include smoking and ingestion.

HHC
Everything You Need to Know about Hexahydrocannabinol

thrive
FLOWER

HHC is a semi-synthetic cannabinoid. It is made by adding hydrogen to Delta-8 THC. This process is called "hydrogenation".

There are contrasting reports on the potency of HHC. Some say it is less strong than both Delta-8 and Delta-9 THC. Others say it is right in between. Start with a LOW dose.

The legality of HHC is in a bit of a grey area. It is derived from hemp which gives it a legal standing federally. Because it is semi-synthetic, that may present an issue. 13 states have banned HHC products.

Besides the psychoactive "high", HHC may be able to help with pain, anxiety, sleep, and digestive issues. Some reports suggest you may be able to pass a drug test after using HHC.



Alternative Cannabinoids: K2 and Spice

- K2 and Spice are designer drugs that mimic the effects of THC.
- These drugs are often marketed and sold as “herbal incense” or “potpourri”.
- The synthetic drug is often incorporated with plant material.
- The most common route of administration is smoking.
- K2 and Spice can cause elevated heart rate, unconsciousness, seizures, hallucinations...

