

Δ-8?

Δ-10?

THC-O?


Δ-6?

SEMI-SYNTHETIC CANNABINOIDS

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What are they?



- Cannabinoids: group of substances found in the cannabis plant
 - "Marijuana" refers to parts of or products from the plant *Cannabis Sativa* that contains substantial amounts of tetrahydrocannabinol (THC)
 - More than 100 cannabinoids have been identified
- Delta-9 THC: primary psychoactive cannabinoid in the cannabis plant
- Industrial hemp is considered to have very little THC under US law
- Synthetic cannabinoids: man made chemicals that interact with cannabinoid receptors; more accurate to say synthetic cannabinoid receptor agonists (SCRAs)
- Semi-synthetic cannabinoids: maintain the chemical structure of THC with small modifications

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Order of Events




- 2018 Agriculture Improvement Act or "Farm Bill"
 - Amended the federal Controlled Substances Act to exclude hemp and hemp derivatives
 - Exclude *Cannabis sativa* L. and any part of that plant including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts and salts of isomers with a Delta-9 tetrahydrocannabinol concentrations <0.3%
 - Intention was to allow farmers to produce industrial hemp
- Manufacturers subsequently produced full-spectrum extracts, isolates, and other widely available products containing cannabidiol (CBD)
- Some hemp companies diversified products by creating new cannabinoid products

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Amazon Offerings




Hemp Oil :: Hemp 10,000mg :: Hemp Extract :: May Help with Joint Support, Hair, Skin, Nail... Liquid - 4 Ounce (Pack of 1)
4.2 ★★★★★ (120)
\$79⁹⁹ (\$30.00/Ft Oz)
\$75.99 with Subscribe & Save discount
FREE delivery




Eclipse Hemp Gummies - 36,000 MG (60 Count) - 600 MG Per Gummy Bear with Hemp... Gummy - 60 Count (Pack of 1)
4.2 ★★★★★ (1,076)
\$20⁹⁹ (\$0.35/Count)
-prime
FREE delivery Tue, Apr 11 on \$25 of items shipped by Amazon
Or fastest delivery Fri, Apr 7



Medical Miracles Hemp 500 MG Ultra Strength Healing Salve Ideal for Hips, Joints, Neck... 2 Ounce (Pack of 1)
4.2 ★★★★★ (1,358)
\$29⁹⁹ (\$14.97/Count)
\$28.99 with Subscribe & Save discount
-prime
FREE delivery Tue, Apr 11
Or fastest delivery Sat, Apr 8



Rosebudz Extracts Hemp Oil 500 mg Flavored (Cotton Candy) (1.0 ml / Full Gram) Adult - 1 Gram (Pack of 1)
4.0 ★★★★★ (46)
\$29⁹⁹ (\$29.99/Count)
FREE delivery Apr 12-19
Or fastest delivery Fri, Apr 7



Nu Bloom Botanicals Balance Oral Spray - Nano Hemp Spray for Calm Support and Wellness... Adult - 0.27 Fl Oz (Pack of 1)
3.8 ★★★★★ (21)
\$21⁹⁹ (\$81.30/Ft Oz)
-prime
FREE delivery Tue, Apr 11 on \$25 of items shipped by Amazon
Or fastest delivery Sat, Apr 8

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Delta-8 THC

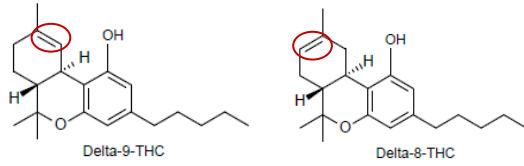
- Delta-8 THC present at low levels in legal hemp plants
- Delta-8 THC can be synthesized from cannabidiol (CBD); therefore, high concentrations of Delta-8 THC have been added as edible and inhaled products
 - Some marketed as "legal hemp" products
- Delta-8 THC concentrations in products can be much higher than what would naturally occur in plants

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Delta-9 THC and Delta-8 THC



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Effects

- Delta-8 THC produces similar profile of typical cannabinoid agonist effects
 - Euphoria
 - Dry mouth
 - Reddened eyes
 - Dizziness
 - Blurred vision
 - Relaxation
 - Increases in heart rate
- Effects are dose dependent
- Initial studies concluded Delta-8 THC is slightly less potent than Delta-9 THC
 - Product marketing advertisement suggest that Delta-8 THC produces more mild high

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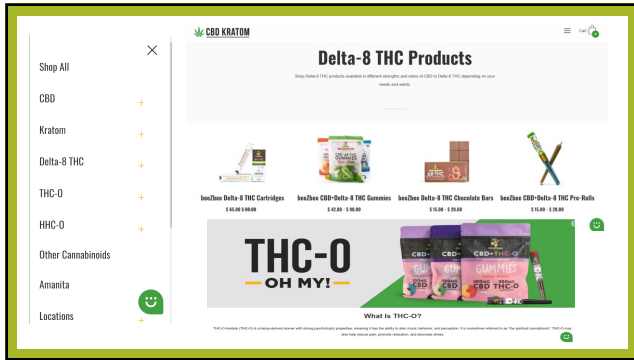
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CBD Kratom carries the largest selection of high quality and natural CBD and Kratom products you'll find anywhere. Each product is lab tested several times for purity and consistency before it's sold in our stores. We carry over 450 CBD products grown organically in Colorado and Oregon and our pure Kratom is sourced from Southeast Asia. CBD Kratom has over 50 retail locations throughout Chicago, Dallas, Houston, New York, Philadelphia, and St. Louis. We've redesigned our in-store shopping experience for your safety and convenience. You can shop with confidence knowing that our employees are following multiple safety guidelines, including wellness checks, personal protective equipment, and social distancing.

[CBD Kratom | Highest Quality Cannabis & Kratom Products - Shop CBD Kratom](#)



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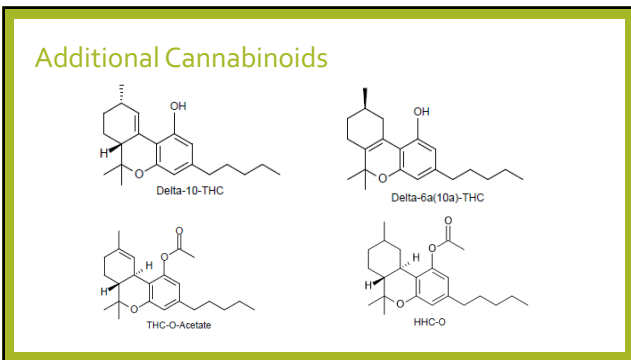
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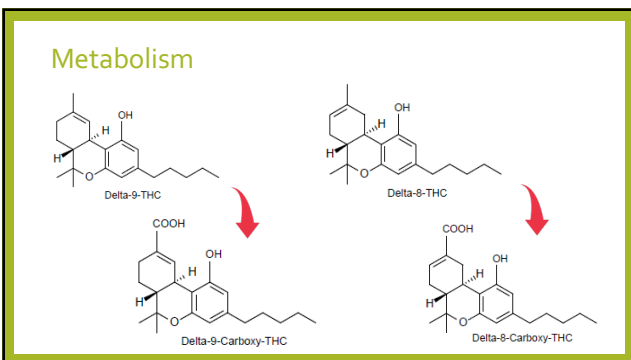
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Analytical Toxicology Issues

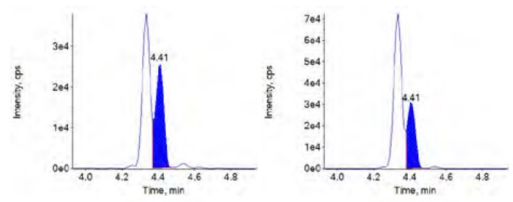


FIGURE 1. URINE SAMPLE CONTAINING A PARTIALLY-RESOLVED INTERFERENCE. THE INTEGRATED PEAK IS Δ9-THCCOOH.

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Analytical Toxicology

- Standards in analytical toxicology require appropriate separation and proper identification of chromatographic peaks
 - The rise of Delta-8 has resulted in analytical problems testing for Delta-9 when both are present together
 - Cancellations have increased as a result → canceled results equates to no results for cannabinoids
 - Other semi-synthetic cannabinoids?
- Toxicology laboratories will likely require isomeric differentiation methods with appropriate baseline separation of parent/metabolites
- Toxicology laboratories may also need to add Delta-8/metabolites (and potentially other semi-synthetic cannabinoids) to their scope of testing
- Certified reference material may be lacking for newer semi-synthetic cannabinoids

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Challenges

- Semi-synthetic cannabinoid products are easily accessible, in a variety of products, and are widely commercially marketed
- Semi-synthetic cannabinoids have activity at CB₁ and CB₂ receptors → therefore, have the potential to impair cognitive skills and motor function
 - Inherent concern with complex tasks such as operating motor vehicles
- Potential for contamination during manufacturing process
 - Delta-9 THC can also be present at concentrations above 0.3% in some products
- Accidental pediatric and animal exposures have increased, likely due to variety of products and commercial packaging/labeling
 - Poison control reports have increased, including cases requiring hospitalizations
- Toxicology reports should be reviewed for cancelled Delta-9 THC/metabolite results
 - Potentially could implicate presence of different semi-synthetic cannabinoid
 - Review laboratory's scope of testing

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Acknowledgements

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