

HISTORY AND KEY DATES

An emerging class of novel psychoactive substances (NPS) derived from natural components found in the *Cannabis sativa* L. plant. These compounds are often isomers, analogs, and homologs of Δ^9 -THC that are marketed and sold as legal alternatives to Δ^9 -THC.

1940s

The synthesis of Δ^8 -THC from cannabidiol (CBD) and the formation of hexahydrocannabinol (HHC) from hydrogenation of THC were first described.

1970

The Controlled Substances Act officially classified marijuana as a DEA-regulated Schedule I drug, making its possession illegal in the United States.

2018

The Farm Bill legalized production of hemp in the United States.

2020

Δ^8 -THC-containing consumer-marketed products became widely available in the United States.

2021

HHC was first identified in the United States.

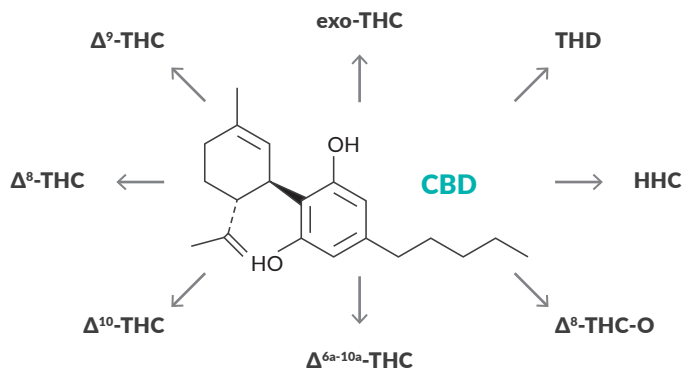
December 2024

Semi-synthetic cannabinoids added to the CFSRE's Recommended Scope for NPS Testing in the United States.

March 2025

HHC placed under international control by the United Nations Commission on Narcotic Drugs (CND).

CBD-DERIVED SEMI-SYNTHETIC CANNABINOIDS



PHARMACOLOGY

In vitro data from [Janssens, L.K., et al., 2024](#) show that many semi-synthetic cannabinoids are pharmacologically similar to Δ^9 -THC, binding to the CB₁ receptors. Accordingly, many have cannabimimetic activities similar to Δ^9 -THC. Chemical modifications including alterations in the length of the alkyl chain and acetylation have been used to increase the potency of these compounds.

More Than 150 Semi-Synthetic Cannabinoid Analytical Standards Available:

- Metabolites
- DEA Exempt Preparations
- Isotopically Labeled Standards
- CRMs

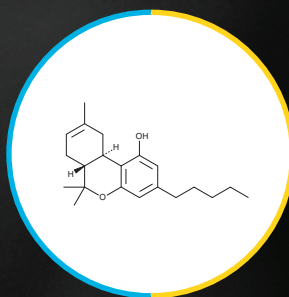


Discover All Semi-Synthetic Cannabinoid Analytical Standards

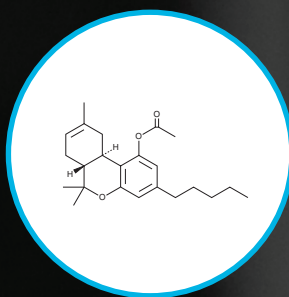
www.caymanchem.com/SSC-standards

View our complete analytical standard line at www.caymanchem.com/forensics

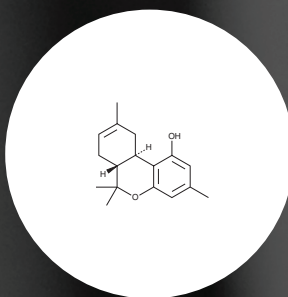
AVAILABLE SEMI-SYNTHETIC CANNABINOID ANALYTICAL STANDARDS



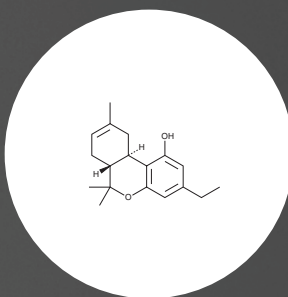
Δ⁸-THC
(ISO60158 | 14042 | 16205)



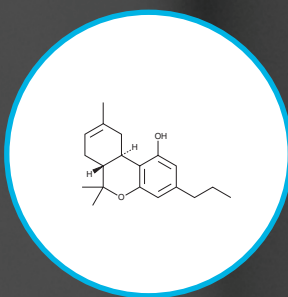
Δ⁸-THC Acetate
(37944 | 29209)



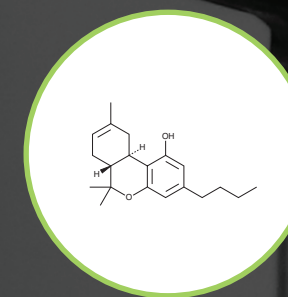
Δ⁸-THCO
(33762)



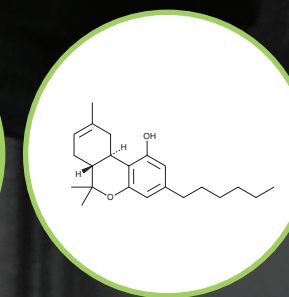
Δ⁸-THC-ethyl
(37954)



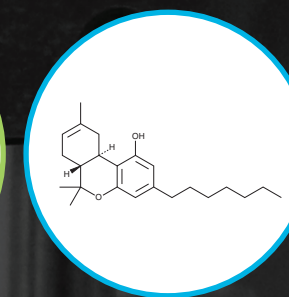
Δ⁸-THCV
(38795 | 27322)



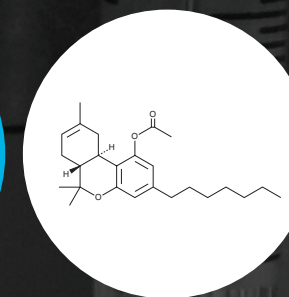
Δ⁸-THCB
(30303 | 37898)



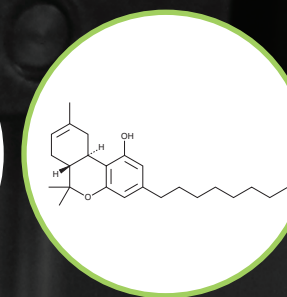
Δ⁸-THCH
(33392 | 38866)



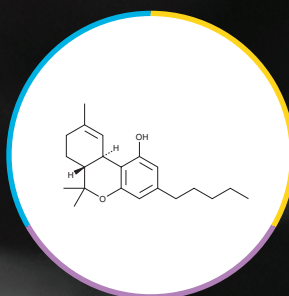
Δ⁸-THCP
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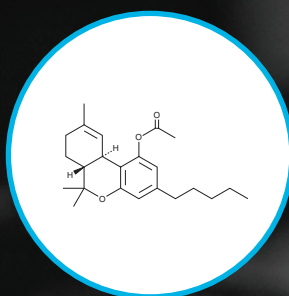
Δ⁸-THCP Acetate
(37966)



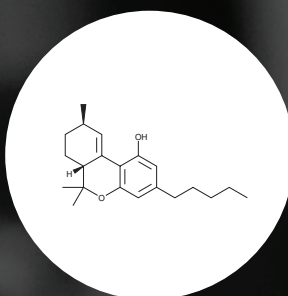
Δ⁸-THC-C8
(35422 | 38149)



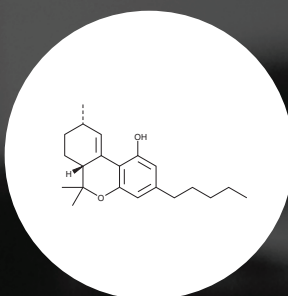
Δ⁹-THC
(ISO60157 | 12068 | 19332)



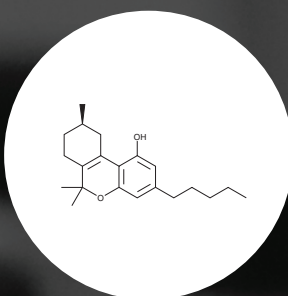
Δ⁹-THC Acetate
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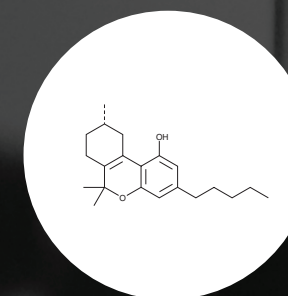
(6aR,9R)-Δ¹⁰-THC
(33011)



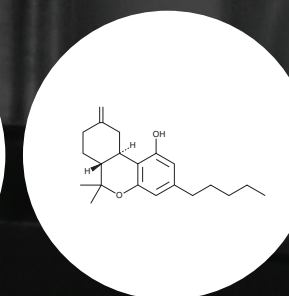
(6aR,9S)-Δ¹⁰-THC
(33012)



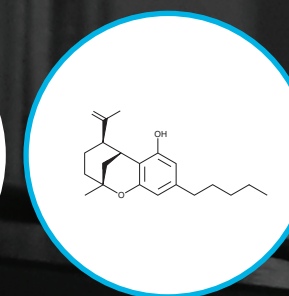
9(R)-Δ^{6a,10a}-THC
(33013)



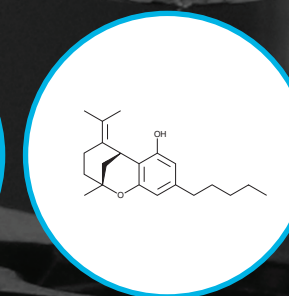
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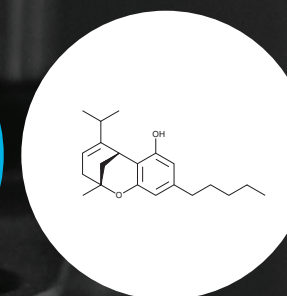
exo-THC
(36898)



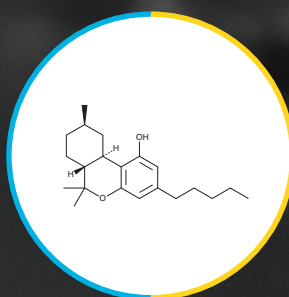
Δ⁸-iso-THC
(39000 | 33864)



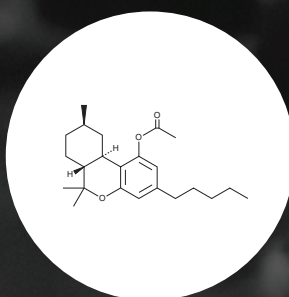
Δ⁴⁽⁸⁾-iso-THC
(39955 | 33863)



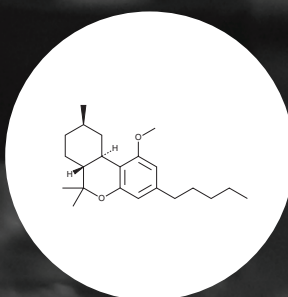
Δ⁴-iso-THC
(33862)



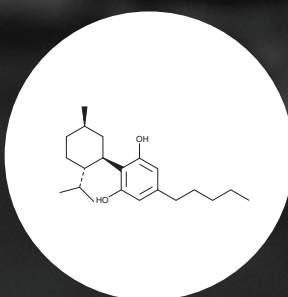
9(R)-HHC
(37913 | 27500 | 39345)



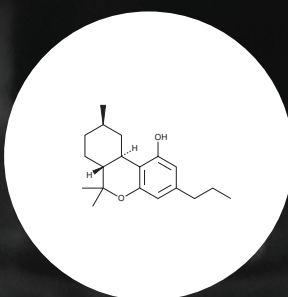
9(R)-HHC Acetate
(35368)



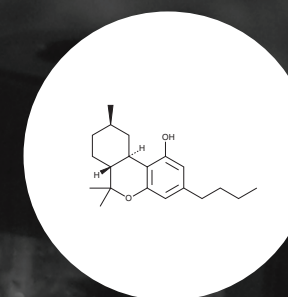
9(R)-HHC methyl ether
(40412)



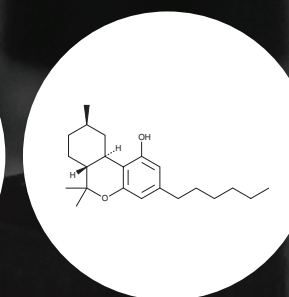
1(R)-THD
(36350)



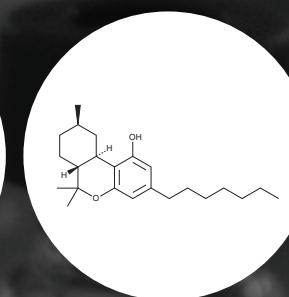
9(R)-HHCV
(38224)



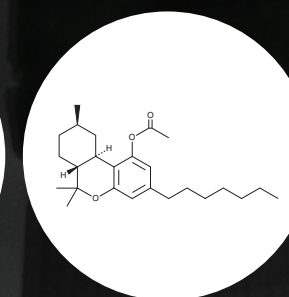
9(R)-HHCB
(40087)



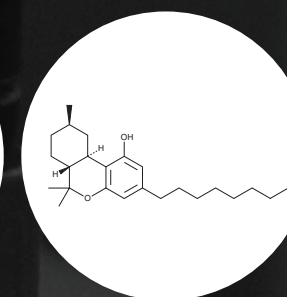
9(R)-HHCH
(38220)



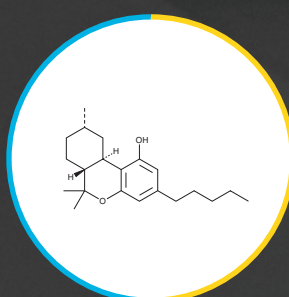
9(R)-HHCP
(36346)



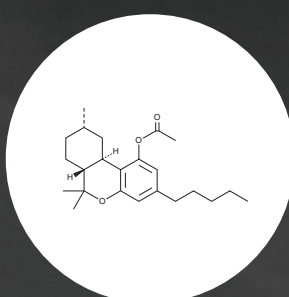
9(R)-HHCP Acetate
(37847)



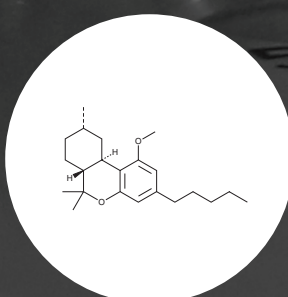
9(R)-HHC-C8
(39899)



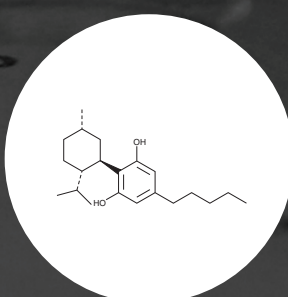
9(S)-HHC
(37942 | 27501 | 39346)



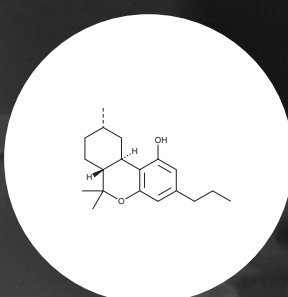
9(S)-HHC Acetate
(35369)



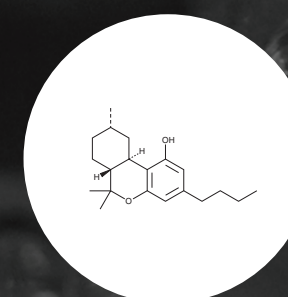
9(S)-HHC methyl ether
(39973)



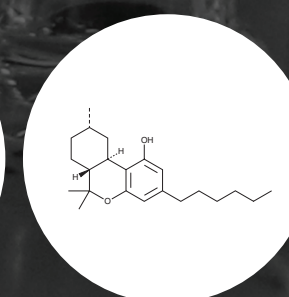
1(S)-THD
(36351)



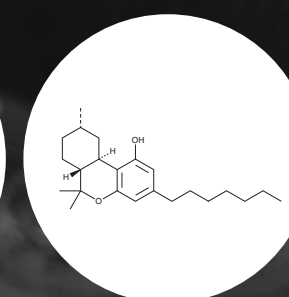
9(S)-HHCV
(38225)



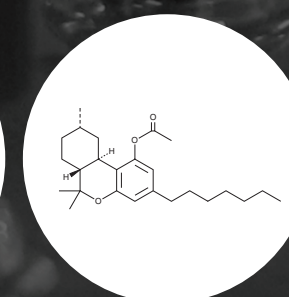
9(S)-HHCB
(40088)



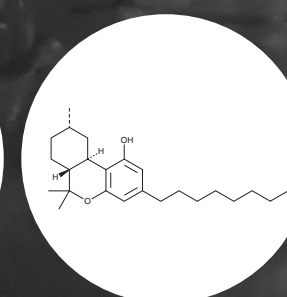
9(S)-HHCH
(38221)



9(S)-HHCP
(36347)



9(S)-HHCP Acetate
(37848)



9(S)-HHC-C8
(40063)

ADDITIONAL SEMI-SYNTHETIC CANNABINOID RESOURCES

Monograph, Issue 3

Δ^9 -THC, Δ^{10} -THC, and $\Delta^{6a,10a}$ -THC:

Cayman NPS Metabolism Monograph

[View the study at](#)

www.caymanchem.com/thc-monograph



Application Note

GC Separation for Identification of *iso*-THC Contaminants and Accurate Quantification of Δ^8 -THC and Δ^9 -THC in *Cannabis* Samples

[See the method at](#)

www.caymanchem.com/thc-contaminants

Application Note

HPLC Method to Differentiate Four THC Stereoisomers Formed from Δ^9 -THC Degradation: (6aR,9R)- Δ^{10} -THC, (6aR,9S)- Δ^{10} -THC, 9(R)- $\Delta^{6a,10a}$ -THC, and 9(S)- $\Delta^{6a,10a}$ -THC

[Learn more at](#)

www.caymanchem.com/thc-stereoisomers

FEATURED TOOLS & RESOURCES FOR NPS IDENTIFICATION

Cayman Chemical is dedicated to working with the forensic community to quickly make authentic reference standards available from our ISO/IEC 17025 and ISO 17034 laboratories.

NPS DASHBOARD

We collaborate with the Center for Forensic Science Research & Education (CFSRE) to provide analytical reference standards for emerging NPS. Cayman maintains an updated dashboard to align with the CFSRE's quarterly NPS scope recommendations, matching reference standards with recommended NPS to help testing laboratories easily find reference standards to the most pressing NPS.

[View the dashboard at](#) www.caymanchem.com/NPS-dashboard



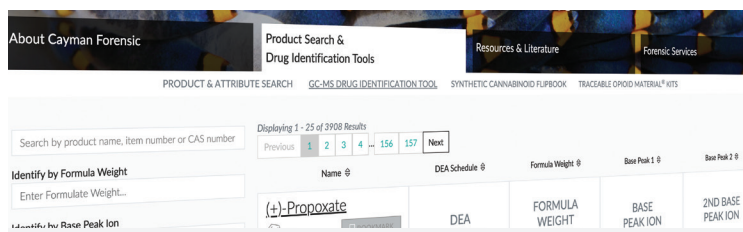
MASS SPEC RESOURCES



Cayman Spectral Library

Our free, searchable, GC-MS spectral database contains 70eV EI mass spectral data of 2,500+ of Cayman's forensic drug standards.

[Download the database at](#) www.caymanchem.com/CSL



GC-MS Drug Identification Tool

Cayman's GC-MS drug identification tool can help you search unknowns by formula weight, base peak, and 2nd base peak ion.

[View the tool at](#) www.caymanchem.com/drugID