



EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

22 September 2021
EMA/HMPC/161753/2020
Committee on Herbal Medicinal Products (HMPC)

Compilation of terms and definitions for Cannabis-derived medicinal products

Scope of this document

Given the increased public interest in the therapeutic use of products derived from the plant *Cannabis sativa* L., this Compilation of terms and definitions is established by the Committee on Herbal Medicinal Products (HMPC), upon the request from the European Commission, in order to foster a more harmonised approach in the presentation and manufacturing of Cannabis-derived medicinal products.

The aim of the document is to summarise existing scientific and legislative terminology that would be of relevance in the context of evaluation of Cannabis-derived medicinal products, taking into account EU legislation on medicinal products, EU pharmaceutical quality guidelines and standards of the European Pharmacopoeia.

In order to establish a broad overview, HMPC included not only terms related to herbal substance, herbal preparation or herbal medicinal product, but also considered a non-exhaustive selection of isolated constituents.

This document does not address and is without prejudice to the use, the classification nor the legal status of Cannabis-derived substances or products in the different EU Member States.



Table of contents

Table of contents	2
1. Introduction	3
2. Compilation of terms and definitions	3
2.1. Medicinal product	3
2.2. Herbal substance	4
2.2.1. The plant <i>Cannabis sativa</i> L.	5
2.2.2. Plant parts	5
2.3. Herbal preparation	6
2.3.1. Commonly used terms and related Ph. Eur. terms/definitions	7
2.3.2. Commonly used terms - insufficiently defined	9
2.4. Cannabis constituents.....	10
2.4.1. Cannabinoids	10
2.4.2. Volatile terpenes (essential oil)	13
2.4.3. Phenolic compounds	13
2.5. Other terminology to take into account in the development of Cannabis-based medicinal products.....	13

1. Introduction

Products containing Cannabis-derived substances that meet the definition of a medicinal product (as stated in Article 1(2) of Directive 2001/83/EC), must comply with the requirements of the pharmaceutical law, in particular those laid down in Directive 2001/83/EC, and to relevant pharmaceutical standards to be authorised in the Union, such as those defined in the European Pharmacopoeia (Ph. Eur.), an official Compendium of standards developed by the European Directorate for the Quality of Medicines & HealthCare (EDQM).

Directive 2001/83/EC provides definitions for 'medicinal product' and 'active substance' as well as for 'herbal medicinal product', 'herbal substance' and 'herbal preparation'. The Ph. Eur. provides general and specific methods and monographs on the quality control of single substances, and also on herbal drugs (herbal substances) or herbal drug preparations (herbal preparations). EDQM provides also a list of agreed standard terms that are used in European marketing authorisation applications, labelling (including summaries of product characteristics (SmPCs), electronic communications and adverse-event reporting).

This glossary aims to compile existing terms and definitions that are relevant in the description and assessment of medicinal products containing active substances of herbal origin, including those containing Cannabis-derived substances. Additionally, some terms often used outside the pharmaceutical area in the context of Cannabis-derived products are briefly commented when considered important to minimise the risk of confusion.

This compilation is not exhaustive. Of note, terms related to the recreational use of Cannabis, for instance described in documents issued by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) or as used in the framework of UN international treaties for control of narcotic drugs, were not included since they fall outside the scope of this document. Also, manifold aspects and terminology related to other uses of *Cannabis* plants and derived substances/products including industrial hemp for fibre or food use are not subject of this compilation solely focused on pharmaceutical standard terminology.

2. Compilation of terms and definitions

2.1. Medicinal product

Definitions:

Article 1 of Directive 2001/83/EC defines the following:

Medicinal product

'(a) Any substance or combination of substances presented as having properties for treating or preventing disease in human beings; or

(b) Any substance or combination of substances which may be used in or administered to human beings either with a view to restoring, correcting or modifying physiological functions by exerting a pharmacological, immunological or metabolic action, or to making a medical diagnosis.'

Active substance

'Any substance or mixture of substances intended to be used in the manufacture of a medicinal product and that, when used in its production, becomes an active ingredient of that product intended

to exert a pharmacological, immunological or metabolic action with a view to restoring, correcting or modifying physiological functions or to make a medical diagnosis.'

Herbal medicinal product

'Any medicinal product, exclusively containing as active ingredients one or more herbal substances or one or more herbal preparations, or one or more such herbal substances in combination with one or more such herbal preparations.'

Comments/clarifications:

Cannabis-derived medicinal products, depending on their specific composition, may fall in the definition of a herbal medicinal product. Similarly, to any other medicinal product originating from a plant, Cannabis-derived medicinal products may contain as active substance an isolated constituent, or herbal substance(s) or herbal preparation(s) or combinations thereof that are usually more complex and have their specific quality standards (see below).

2.2. Herbal substance

Definitions:

Herbal substance (Article 1 of Directive 2001/83/EC)

'All mainly whole, fragmented or cut plants, plant parts, algae, fungi, lichen in an unprocessed, usually dried, form, but sometimes fresh. Certain exudates that have not been subjected to a specific treatment are also considered to be herbal substances. Herbal substances are precisely defined by the plant part used and the botanical name according to the binomial system (genus, species, variety and author).'

Herbal Drugs (Ph. Eur. monograph 1433)

'Herbal drugs are mainly whole, fragmented or broken plants or parts of plants in an unprocessed state, usually in dried form but sometimes fresh. In this general monograph, the word 'plant' is used in the broader sense to also include algae, fungi and lichens. Certain exudates that have not been subjected to a specific treatment are also considered to be herbal drugs. Herbal drugs are precisely defined by the botanical scientific name according to the binominal system (genus, species, variety and author). The term herbal drug is synonymous with the term herbal substance used in European Community legislation on herbal medicinal products.'

Comments/clarifications:

Typical Cannabis-derived herbal substances like flowers (Cannabis flos) or resin (Cannabis resina) are covered by the 'herbal substance' definition in Directive 2001/83/EC and in the Ph. Eur. monograph on herbal drugs.

Herbal substances are determined by the source plant and the plant part. Both are usually distinguished and specified in individual monographs of the European Pharmacopoeia, or in absence thereof, in the pharmacopoeias currently used officially in the EU Member States. Pharmacopoeia monographs provide definition, description, identity, purity and assay tests of a herbal substance. While a monograph for 'Cannabis flos' or derived preparations or constituents is not yet published in Ph. Eur., some EU Member States, like Denmark or Germany, have published monographs in national pharmacopoeias.

2.2.1. The plant *Cannabis sativa* L.

A **Cannabis plant for medicinal use** is any cultivar (variety, chemovar, chemotype) of the species *Cannabis sativa* L. which is intended to be used as *Cannabis* herbal substance and/or in *Cannabis* medicinal products, irrespectively of the cannabinoids' content (as it is in accordance with Article 1 of Directive 2001/83/EC which defines Herbal substances; see 2.2.).

Comments/clarifications:

Botanically, only Cannabis sativa L. is an accepted species. All others, for instance, Cannabis indica Lam. or Cannabis ruderalis Janisch. are considered synonyms (World Flora Online)¹. The medicinal plant names database of Kew Science² mentions 32 scientific synonyms for the species Cannabis sativa L.³

Different cultivars (varieties, chemovars, chemotypes) with a wide spectrum of qualitative and quantitative variability in main cannabinoids are known but are considered as belonging to the same species C. sativa. L. See also Comments in 2.2.2.

2.2.2. Plant parts⁴

Definitions:

I) Cannabis bract

A leaf situated at the base of the flowers of *Cannabis sativa* L., which is more or less densely covered with glandular trichomes and may partly surround a developing fruit. Usually the leaf is not used alone but as part of the flowering tops.

II) Cannabis bud (*Cannabis flos immaturus*)

Whole, fresh or dried flower bud of female *Cannabis sativa* L.

III) Cannabis flower (*Cannabis flos*) (often referred to as "Cannabis flowering tops")

Blossoming, dried shoot apices of female *Cannabis sativa* L. (*Cannabaceae*) plants.

IV) Cannabis glandular trichome

Fine hairy 'excessions' around the flowering tops of female *Cannabis sativa* L. which produce an exudate (resin) containing cannabinoids. Usually not used alone but as part of the flowering tops.

V) Cannabis leaf

A leaf of *Cannabis sativa* L. which may or may not include the bracts.

VI) Cannabis seed

¹http://www.worldfloraonline.org/search?query=cannabis+indica&limit=24&start=0&facet=taxon.taxon_rank_s%3ASPECIES&facet=taxon.taxonomic_status_s%3AAccepted&sort

²<https://mpns.science.kew.org/mpns-portal/plantDetail?plantId=696480&query=cannabis&filter=&fuzzy=false&nameType=all&dbs=wcsCmp>

³See also: Castroviejo S, Aedo C, Cirujano S, Laínz M, Montserrat P, Morales R, et al. (2006). *Flora iberica* 3, 2^a Ed. *Real Jardín Botánico, CSIC, Madrid*. p. 257-261; Small, E. (2015). Evolution and Classification of *Cannabis sativa* (Marijuana, Hemp) in Relation to Human Utilization. *Botanical Review*, 81:189-294

⁴The definitions included in this section are in accordance with the published monographs, like the German Pharmacopoeia monograph on *Cannabis flos*, the Danish Monograph "*Cannabisblomst*" and also with the accepted definitions of botanical terms like, for instance, the ones included in the GLOSSAIRE DES TERMES BOTANIQUES UTILES POUR L'IDENTIFICATION A (Drogues végétales) of the French Pharmacopoeia

A seed of *Cannabis sativa* L.

Comments/clarifications:

Cannabis flos is listed here as a plant part but it is also used as an overarching term for the herbal substance, defined in a specific pharmacopoeia monograph (see 2.2) that includes also other plant parts listed above, such as bracts.

Considering that safety and efficacy of different Cannabis-derived substances depend on the content of the individual cannabinoids, including the ratio between Δ^9 -tetrahydrocannabinol (THC) and cannabidiol (CBD), the individual cannabinoids have to be determined and, usually, like in the DAB monograph (see below), three different product groups are recognized.

German Pharmacopoeia Monograph (DAB) '*Cannabis flos*' - Cannabis flowers consist of blossoming, dried shoot apices of female *Cannabis sativa* L. (Cannabaceae) plants:

Note

Non-binding information on the relative content of cannabinoids in cannabis flowers:

Product group	Content of
I	Δ^9 -tetrahydrocannabinol >> cannabidiol
II	Δ^9 -tetrahydrocannabinol \approx cannabidiol
III	Δ^9 -tetrahydrocannabinol << cannabidiol

2.3. Herbal preparation

Definitions:

Herbal preparation (Article 1 of Directive 2001/83/EC)

'Preparations obtained by subjecting herbal substances to treatments such as extraction, distillation, expression, fractionation, purification, concentration or fermentation. These include comminuted or powdered herbal substances, tinctures, extracts, essential oils, expressed juices and processed exudates.'

Herbal Drug Preparations - *Plantae medicinales praeparatae* (Ph. Eur. monograph 1434)

'Herbal drug preparations are homogeneous products obtained by subjecting herbal drugs to treatments such as extraction, distillation, expression, fractionation, purification, concentration or fermentation.'

Herbal drug preparations include, for example, extracts, essential oils, expressed juices, processed exudates, and herbal drugs that have been subjected to size reduction for specific applications, for example herbal drugs cut for herbal teas or powdered for encapsulation.'

Comments/clarifications:

Cannabis-derived herbal preparations such as extracts are covered by the herbal preparation definition in Directive 2001/83/EC and to the Ph. Eur. monograph on herbal drugs preparations, generally applicable for herbal preparations.

Even in the absence of specific monographs in the Ph. Eur., herbal preparations comply with applicable general chapters and monographs for several parameters and definitions important for distinction, declaration and quality requirements and specifications (including identification and content of main constituents). These terms have been used for decades in medicinal products containing herbal preparations (see 2.3.1). However, some terms often used for Cannabis-derived preparations, that are ambiguous and could comprise several defined terms, are listed below (see 2.3.2).

2.3.1. Commonly used terms and related Ph. Eur. terms/definitions

I) Cannabis extracts

Definitions⁵:

Herbal Drug Extracts - *Plantarum medicinalium extracta* (Ph. Eur. monograph 0765)

'Herbal drug extracts are liquid (liquid extraction preparations), semi-solid (soft extracts and oleoresins) or solid (dry extracts) preparations obtained from Herbal drugs (1433) using suitable solvents.

An extract is essentially defined by the quality of the herbal drug, by its production process (extraction solvent(s), method of processing, etc.) and by its specifications.

European Pharmacopoeia monographs for extracts cover the genuine (native) extract and, where present, excipients.

Different types of extract may be distinguished.

Standardised extracts are adjusted to a defined content of one or more constituents with known therapeutic activity. This is achieved by adjustment of the extract with inert excipients or by blending batches of the extract.

Quantified extracts are adjusted to one or more active markers, the content of which is controlled within a limited, specified range. Adjustments are made by blending batches of the extract.

Other extracts are not adjusted to a particular content of constituents. For control purposes, one or more constituents are used as analytical markers. The minimum content for these analytical markers is given in an individual monograph.

(...)

Liquid extraction preparations - *Praeparationes fluidae ab extractione* including **tinctures (*tincturea*)**

Liquid extraction preparations are liquid preparations consisting of a diverse range of products which are described by their extraction solvents, methods of production and drug solvent ratios or drug extract ratios. Included in this range are products obtained using ethanol, water, glycerol, propylene glycol and fatty oils as extraction solvents. Liquid (fluid) extracts and tinctures belong to this category and are described below.

Liquid (Fluid) extracts – *extracta fluida*

Quantified liquid (fluid) extracts and 'other' liquid (fluid) extracts are liquid extraction preparations of which, in general, 1 part by mass or volume is equivalent to 1 part by mass of the dried herbal drug.

Standardised liquid (fluid) extracts are only defined by their content of constituents with known therapeutic activity.'

Tinctures – *tincturae*:

⁵ Only main parts of the Ph. Eur. monograph 0765 are quoted here. For a better understanding of the differences between defined types of extracts see the complete text of the General monograph 0765 and the corresponding General Chapter 5.23. "Monographs on herbal drug extracts (information chapter) - Basis for elaboration of monographs on herbal drug extracts".

Quantified tinctures and 'other' tinctures are liquid extraction preparations that are obtained using either 1 part by mass of herbal drug and 10 parts by mass or volume of extraction solvent, or 1 part by mass of herbal drug and 5 parts by mass or volume of extraction solvent. Alternatively, they may be obtained using either 1 part by mass of herbal drug and sufficient extraction solvent to produce 10 parts by mass or volume of tincture or 1 part by mass of herbal drug and sufficient extraction solvent to produce 5 parts by mass or volume of tincture. Other ratios of herbal drug to extraction solvent may be used.

Standardised tinctures are only defined by their content of constituents with known therapeutic activity.'

(...)

Soft extracts – *extracta spissa*

Soft extracts are semi-solid preparations obtained by evaporation or partial evaporation of the solvent used for production.

(...)

Oleoresins – *oleoresina*

Oleoresins are semi-solid extracts composed of a resin in solution in an essential and/or fatty oil and are obtained by evaporation of the solvent(s) used for their production.

This monograph applies to oleoresins produced by extraction and not to natural oleoresins.'

(...)

Dry extracts – *extracta sicca*

Dry extracts are solid preparations obtained by evaporation of the solvent used for their production.

Dry extracts usually have a loss on drying of not greater than 5% m/m. Where justified and authorised, a loss on drying with a different limit or a test for water may be prescribed.'

Comments/clarifications:

Extracts may have been produced using different extraction solvents and/or extraction processes and may include different types and contents of excipients (added for technological purposes during production of the extract). 'An extract is essentially defined by the quality of the herbal drug, by its production process (extraction solvent(s), method of processing, etc.) and by its specifications'.

Extract subcategories according to physical state/solvent characteristics (liquid, dry, oleoresins etc.) can all belong to the three extract types as regards level of specification and adjustment of constituents (standardised, quantified or 'other' extracts).

The production process can include several steps including purification: 'Extraction with a given solvent leads to a typical content of selected constituents in the extracted dry matter; during production of standardised and quantified extracts, purification procedures may be applied that increase the content of these selected constituents with respect to the expected values; such extracts are referred to as 'refined'' (Ph. Eur. General Chapter 5.23).

II) Cannabis seed oil

Cannabis seed oil (*Cannabis sativae semen oleum*), a fatty oil obtained by extraction with a solvent (including supercritical carbon dioxide), expression or other suitable process from the seeds of *Cannabis sativa* L. corresponds to Ph. Eur. monograph 1579:

Vegetable fatty oils - *Olea herbaria* (Ph. Eur. monograph 1579)

'Vegetable fatty oils are mainly solid or liquid triglycerides of fatty acids. They may contain small amounts of other lipids such as waxes, free fatty acids, partial glycerides or unsaponifiable matters. Vegetable fatty oils are obtained from the seeds, the fruit or the pit/stone/kernel of various plants by expression and/or solvent extraction, then possibly refined and hydrogenated. A suitable antioxidant may be added if necessary.'

2.3.2. Commonly used terms - insufficiently defined

I) "Cannabidiol oil"

The term 'Cannabidiol oil' is not an accurate expression since it could refer to several types of preparations. Cannabidiol oil is commonly used to refer to 3 different types of preparations:

- a) More or less purified cannabidiol dissolved in a vegetable oil (e.g., in almond oil or in hemp seed oil)
- b) An extract (e.g. ethanol extract) of heat treated* hemp herb which is mixed with a vegetable oil
- c) Heat treated* hemp herb which is extracted with oil

*) Heat treatment transforms the naturally occurring cannabidiolic acid and Δ^9 -tetrahydrocannabinolic acid into their active forms cannabidiol (CBD) and Δ^9 -tetrahydrocannabinol (THC), respectively.

Preparations described under (a) are isolated active substances dissolved in a vegetable fatty oil and do not correspond to the definitions of 'herbal (drug) preparation' (see 2.3) or any type of extract described in Ph. Eur. The correct term would be "Cannabidiol (dissolved) in <specified fatty oil>."

Preparations (b) and (c) correspond to the 'herbal (drug) preparation' definitions possible as standardised or quantified extracts.

As "Cannabidiol oil" does not correspond to an unambiguous scientific definition and accurate description of the active substance from a regulatory quality perspective, it could be misleading and should not be used⁶.

II) "Cannabis oil"

The term 'Cannabis oil' is not an accurate expression since it could refer to several types of preparations.

The term is commonly applied to both the herbal preparation (extract) and the finished product, e.g. Cannabis extract in an oily solvent to be used as oral drops. It was found used for:

- a) a fatty oil obtained by extraction with solvent (including supercritical carbon dioxide), expression or other suitable process from the seeds of *Cannabis sativa* L. (see 2.3.1 Herbal preparation, II Cannabis seed oil)
- b) an herbal preparation that is obtained by extracting *Cannabis* aerial parts with a vegetable oil (=incorrect pharmaceutical name), or
- c) a preparation that is a mixture of an extract of *Cannabis* aerial parts (e.g. ethanolic extract) and a vegetable oil (=incorrect pharmaceutical name)

Preparations described under (b) correspond to definitions of Liquid extraction preparations (see 2.3.1 Herbal preparation, I) - possible as standardised or quantified extracts according to Ph. Eur. definitions.

⁶ For better understanding of how active substances in herbal medicinal products are correctly declared in relation to existing Ph. Eur. definitions see HMPC guideline [EMA/HMPC/CHMP/CVMP/287539/2005 Rev.1](https://www.ema.europa.eu/en/medicines/human/ich/ich-qa/q-and-a-answers/2015/05/2015-05-20-ich-qa-q-and-a-answers-287539-2005-rev-1)

Preparations described under (c) could be considered as finished medicinal products containing as active substance an extract corresponding to an 'herbal (drug) preparation' definition, possible as standardised or quantified extracts, according to Ph. Eur. definitions, solubilized in a vegetable oil.

As "Cannabis oil" does not correspond to a scientifically unambiguous meaning and accurate description of the active substance from a regulatory quality perspective, it could be misleading and should not be used⁷.

2.4. Cannabis constituents

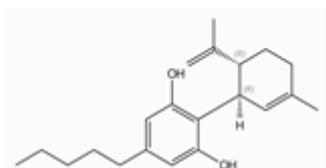
In the following cannabinoids are shortly listed as the main characteristic compound group linked to the main activities/ medicinal uses. Terpenoids and flavonoids are mentioned, because postulated by some to potentially contribute to the characteristics of *Cannabis* herbal substances and preparations. This list is not exhaustive and for a more complete overview of *Cannabis* constituents it is suggested to refer to scientific review articles.

2.4.1. Cannabinoids

Cannabinoids have a non-polar structure featuring alkylresorcinol and monoterpene moieties in their molecules. Cannabinoids are classified as neutral cannabinoids (without carboxyl group) and cannabinoid acids (with carboxyl group). In *C. sativa*, cannabinoids are biosynthesized and accumulated as cannabinoid acids, and subsequently decarboxylated into their neutral forms⁸. Below are some examples of the most quantitatively present and commonly known cannabinoids out of more than 100 compounds already isolated in this chemical family.

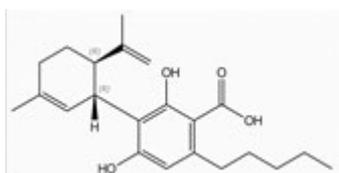
a) Cannabidiol (CBD) - CAS Registry Number: 13956-29-1

Active ingredient of authorised medicinal products such as Epidiolex



b) Cannabidiolic acid (CBDA) - CAS Registry Number: 1244-58-2

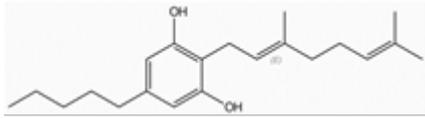
Acid form of cannabidiol.



c) Cannabigerol (CBG) - CAS Registry Number: 25654-31-3

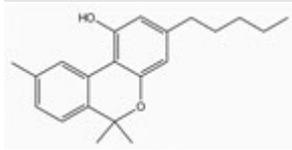
⁷ For better understanding of how active substances in herbal medicinal products are correctly declared in relation to existing Ph. Eur. definitions see HMPC guideline [EMA/HMPC/CHMP/CVMP/287539/2005: Rev.1](https://www.ema.europa.eu/en/medicines/human/EPAR/HMPC/CHMP/CVMP/287539/2005/Rev.1)

⁸ See, for example, Gertsch J, Pertwee RG, Marzo VD (2010), Phytocannabinoids beyond the *Cannabis* plant - do they exist? *Br J Pharmacol.* 2010 Jun, 160(3):523-529; Hanus, LO, Meyer, SM, Muñoz E, Tagliabue S, Scafati O, Appendino G, (2016). Phytocannabinoids: a unified critical inventory. *Nat. Prod. Rep.* 2016, 33:1357-1392

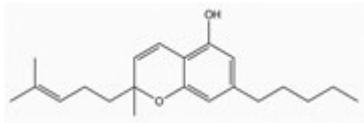


d) Cannabinol (CBN) - CAS Registry Number: 521-35-7

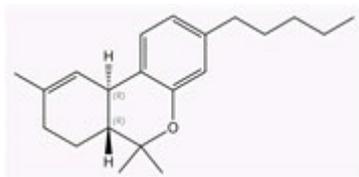
Degradation product of THC.



e) Cannabichromene (CBC) - CAS Registry Number: 20675-51-8



f) Delta-9-Tetrahydrocannabinol (Δ9-THC) - CAS Registry Number: 1972-08-3

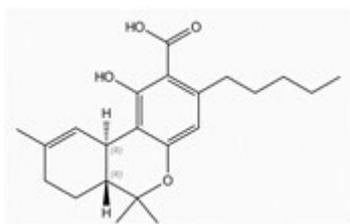


g) 'Delta-9-tetrahydrocannabinolic acid A' (Δ9-THCA-A) - CAS Registry Number: 23978-85-0

Commonly used for the (-)-trans isomer of delta-9-tetrahydrocannabinolic acid that is the only natural form present in Cannabis. One of the acid forms of delta-9-tetrahydrocannabinol (Δ9-THC).

Synonyms:

- Δ1-Tetrahydrocannabinolic acid A
- Δ9-Tetrahydrocannabinolcarboxylic acid
- Δ9-Tetrahydrocannabinolic acid
- Δ9-THC-carboxylic acid



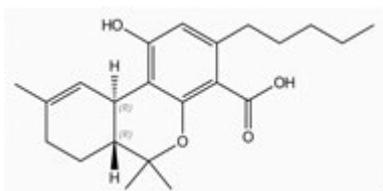
h) Delta-9-tetrahydrocannabinolic acid B (Δ9-THCA-B) - CAS Registry Number: 23978-84-9

One of the acid forms of delta-9-tetrahydrocannabinol (Δ9-THC)

Synonyms:

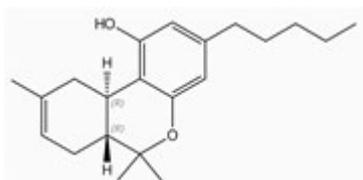
- Cannabinolic acid B, Δ1-tetrahydro-
- Δ1-Tetrahydrocannabinolic acid B

- Δ 9-Tetrahydrocannabinolic acid B

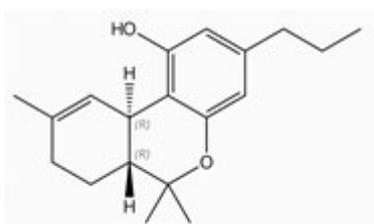


- i) Delta-8-tetrahydrocannabinol (Δ 8-THC) - CAS Registry Number: 5957-75-5

Among the more stable metabolites of Δ 9-THC, it is worth mentioning Δ -8-tetrahydrocannabinol, derived by an acidic isomerization of Δ 9-THC, with a shift of the endocyclic double bond⁹.



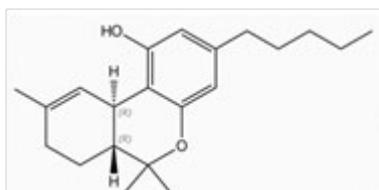
- j) Delta-9-tetrahydrocannabivarin (Δ 9-THCV) - CAS Registry Number: 31262-37-0



Comments/clarifications:

'Dronabinol' - CAS Registry Number: 1972-08-3

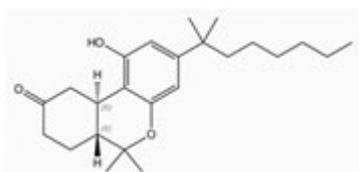
Dronabinol is the INN name for (-)-trans-delta-9-tetrahydrocannabinol (see above f), which is the isomer present in Cannabis. In this respect, dronabinol is not synthetic per default. Actually, synthetic THC may likely consist of more than one isomer. **Do not confuse with Nabilone!**



'Nabilone' - CAS Registry Number: 51022-71-0

Synthetic cannabinoid similar to THC; active ingredient of authorised medicinal products such as Cesamet and Canemes.

⁹ See, for example, Andre, C.M., Hausman, J.-F., Guerriero, G. (2016). *Cannabis sativa*: the plant of the thousand and one molecules. *Front Plant Sci.* 7:19.



There are also several references to 'Nabiximols' (CAS Registry Number: 56575-23-6), which is not one isolated constituent but rather a specific *Cannabis* herbal preparation (extract), containing a defined quantity of specific cannabinoids, approved as a combination drug for oromucosal spray administration, and standardized in composition, formulation, and dose. Its principal active cannabinoid components are the cannabinoids tetrahydrocannabinol (THC) and cannabidiol (CBD) but it also contains other minor cannabinoids, flavonoids, and terpenes.

2.4.2. Volatile terpenes (essential oil)

Terpenes are responsible for the odour and flavour of the different *Cannabis* cultivars (varieties, chemovars, chemotypes).

Terpenes are classified in diverse families according to the number of repeating units of 5-carbon building blocks (isoprene units), such as monoterpenes with 10 carbons or sesquiterpenes with 15 carbons.

More than 100 molecules of terpenes have been identified in *Cannabis*⁶.

2.4.3. Phenolic compounds

Phenolic compounds, including phenylpropanoids, constitute one of the most widely distributed group of secondary metabolites in the plant kingdom. They present more than 10,000 different structures, including phenolic acids, such as benzoic and hydroxycinnamic acids, flavonoids such as flavonols and flavones, stilbenes and lignans.

In *Cannabis*, about 20 flavonoids have been identified, mainly belonging to the flavone and flavonol subclasses, like the prenylated flavones cannflavins A and B⁶.

2.5. Other terminology to take into account in the development of Cannabis-based medicinal products

Standard terms:

Developers have to take into account the standardisation of the following terms by EDQM (so-called 'Standard Terms'): pharmaceutical dose forms, routes and methods of administration, containers, closures, administration devices and units of presentation.

<https://www.edqm.eu/en/standard-terms-database>

Comments/clarifications:

The route of administration, i.e. the path by which the pharmaceutical product is taken into (or makes contact with) the body, is a relevant aspect to obtain the desired therapeutic effect. The administration routes used are usually, in case of Cannabis preparations, the oral route, the pulmonary route (inhalation) or the cutaneous route and should be selected during the development of the medicinal product in accordance with the definitions of the Standard Terms Database of the EDQM (link above).