Subcritical

- CO_2 is cooled to between 5 and 10°C and maintained at a pressure of between 800 to 1500 PSI. At this temperature and pressure combination, CO_2 is a thick fluid. Subcritical CO_2 produces significantly less than supercritical extraction, but the end product is often richer in active cannabinoids and contains almost no waxes. Extracts made with this process have a sticky, oil-like texture.

- **Solvent extractions**

Various alcohol based extraction methods can be used to separate the cannabinoids and other active ingredients from the associated plant material. With all solvent-based extractions, the main risk to the end user is an incomplete evaporation of the solvent. To ensure full evaporation, extracts are often 'purged' through one of a variety of methods such as vacuum purging or winterization.

ISO extraction (QWISO)

- Isopropyl alcohol is frequently used as a solvent in the preparation of cannabis extracts. The most common technique for extracts intended for inhalation is known as a quick wash isopropyl extraction (QWISO). This process involves a short wash of medical grade isopropyl alcohol, followed by the evaporation of the solvent. The isopropyl alcohol must only be in contact with the cannabis for a short time to reduce the amount of non-psychoactive plant material that is present in the end product.
- Long soaks are sometimes used to intentionally extract the non-psychoactive contents of cannabis, mainly for their anti-oxidant effects.
- QWISO extracts are generally vaporized (or smoked) and inhaled, although oral applications are also common. For ingestion to be effective, the extract must be combined with some form of fat or potable alcohol for the body to metabolize the active constituents.

Full cannabis oil extract (FCOE)

- Full cannabis oil extracts (FCOEs) are made using purified ethyl alcohol as the solvent which is typically evaporated after the original plant material is removed. These types of extractions involve either a slow soak over a period of weeks to months or a rapid soak combined with a heat-based extraction of the alcohol and contain little undesirable plant material. Some non-psychoactive compounds are extracted (mainly chlorophyll), generally giving these extracts a green tint.
- In most cases, some or all the alcohol is intentionally left in the extract. These high-alcohol extracts are known as tinctures, and can be effective both as an oromucosal (mouth absorption) application as well as via ingestion. The remaining alcohols allow the body to process the active constituents without the aid of a fat.

Butane Honey Oil

- Butane Honey Oil (BHO) extraction refers to methods using butane as a solvent.
- The speed of the processing as well as the chemical structure of butane results in a final product almost free of impurities. Butane produces one of the purest extractions (often being composed of more than 90% THC), albeit typically at a lower yield than those produced with alcohol.
- The BHO extracts provided by the VCBC are created using high purity N-butane and then are vacuumed purged for at least 12 hours. Each batch is then lab-tested for purity and potency.

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VCBC

Extracts

Varieties and Properties

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- **Introduction**

The term 'cannabis extracts' refers to any method used to refine the active constituents of cannabis into a more potent and purified form. There are many different techniques by which this can be achieved.

NOTE: Both alcohol and butane based extractions involve the evaporation of highly volatile (and frequently dangerous) liquids. These liquids (isopropyl alcohol, butane, ethyl alcohol, etc…) all have very low flash-points and their vapours are heavier than air. Improper ventilation can lead to the work space becoming filled with a highly flammable gas. This means that these sorts of extractions should only be performed by professionals within a highly controlled environment. Improper and unsafe production techniques can result in both dangerous impurities in the final product, as well as serious personal injury or death.

- **Mechanical Extractions**

Bubble hash

- Bubble hash refers to extracts that have been separated with the aid of both water and cold temperatures. At low enough temperatures the trichomes of cannabis become brittle and easily break free of the other plant matter. This is achieved via an ice bath and agitation of the resulting mix, followed by filtration to remove much of the non-psychoactive plant material from the newly separated trichomes.
- The "bubble" in bubble hash relates to the fact that high quality bubble hash literally bubbles while being smoked (a trait shared by most quality extracts).
- Dry ice (frozen carbon dioxide) can also be used, which eliminates the need for water, simplifying the process immensely, while simultaneously slightly increasing production costs.

Sifted hash

- Sifted hashes (kiefs) have been mechanically dry-extracted through one of several different sifting techniques (silk-screening, tumbling) and are one of the simplest and safest methods used to refine cannabis.
- The production of a sifted hash is time consuming, is the least efficient method of refining cannabis in terms of total psychoactive content removed from the original plant material, and the end product often contains the lowest concentration of cannabinoids of all refinement processes. This also means that a higher amount of both desirable (terpenes, flavonoids, etc…) and undesirable components (waxes, fats, etc…) are present in the final product. This can lead to more beneficially effective synergies between different chemical aspects of the final product, but can also increase the risk of respiratory irritation.

- **Glycerine and propylene glycol**

Both glycerine and propylene glycol can be used to extract cannabinoids. Electronic cigarettes typically use one or both of these compounds as a carrier for nicotine, as they are non-toxic via inhalation and evaporate easily. These extracts are a golden-brown colour, and (when properly mixed with a small amount of an emulsifier such as ethyl alcohol) vaporize easily in many wick-based vapour pens.

- Possible risks
  - Glycerine may cause problems for asthmatics, coating lungs.
  - Overheating glycerine or propylene glycol while looking for a more substantial hit may cause formation of undesirable content, such as benzene. This overheating (known informally as a "dry hit") can be extremely irritating to the throat and lungs.
  - Although propylene glycol and glycerine are approved for inhalation in both Canada and the United States, this approval is for the medical grade quality of these two substances. Lower quality grades (food grade, industrial grade, etc…) can contain impurities that could potentially be harmful over long term, consistent exposure. It is recommended that the medical quality grade of the product used to make the extract is well demonstrated and labelled by the producer.
  - Propylene glycol is a known respiratory tract irritant, even when used properly.

- **Supercritical and subcritical CO2**

In its liquid form, carbon dioxide is a powerful solvent. One of the main advantages of using CO2 as a solvent in the extraction of cannabis is that the solvent is easily and thoroughly purged from extracts, and has no harmful breakdown components. There are two main techniques that use liquid CO2 as a method to create extracts: supercritical CO2 extraction and subcritical CO2 extractions.

Supercritical

- At above 31.1°C and while under over 1078 PSI of pressure (although pressures of between 6 000 and 10 000 PSI are often used in production settings), CO2 becomes what is known as a supercritical fluid, expanding to fill the entire space containing it (similar to a gas) but with a density comparable to a liquid.
- The high pressures involved in this process lead to a very thorough extraction of cannabinoids, but also extract much of the waxes contained within it. This gives the final product an off-white, waxy appearance. These waxes are then often removed in post-processing, resulting in a much more pure product.