Application of SepaBean™ for the Rapid and Effective Purification of CBD and THC in Cannabis

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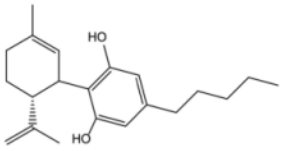
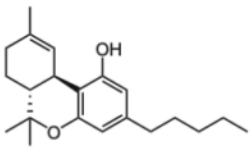
Introduction

Cannabinoids: cannabidiol (CBD), tetrahydrocannabinol (THC), and terpenes (myrcene, linalool) – have been used and studied for the treatment of various conditions, such as acute and chronic pain, kidney disorders, Alzheimer's disease, opioid and nicotine dependence or post-traumatic stress disorder. THC and CBD can also help treat nausea brought on by chemotherapy and to counter poor appetite and weight loss due to chronic illnesses.

Cannabidiol (CBD, $C_{21}H_{30}O_2$) and Δ^9-trans-tetrahydrocannabinol (THC, $C_{21}H_{30}O_2$) have the same chemical formula. THC is psychoactive hence its usage is strictly limited by law. The non-psychotropic cannabinoid CBD has shown extensive pharmacological effect. It is important to separate THC from CBD, since CBD extract that contains higher than 0.3% of THC is prohibited in many parts of the world.



Cannabidiol (CBD)



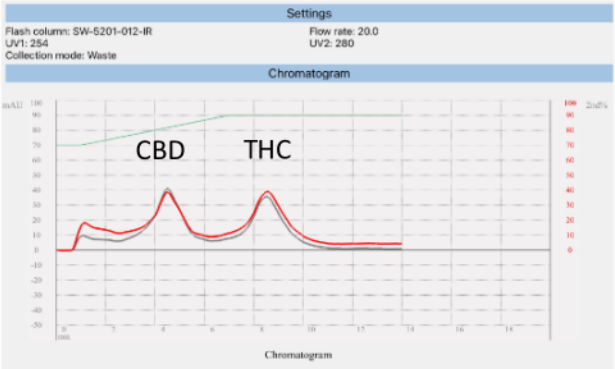
1 (Δ^9-THC-C_5)

Our SepaBean™ is an automatic flash chromatography system that is capable of purifying large samples (10 mg ~ 33g) rapidly and effectively. By using pre-packed flash columns and a fully automated instrument, target molecules (CBD and THC) from crude cannabis extract are isolated, more importantly, this separation is automatic and reproducible.

Cannabis was purchased directly from SQDC (Société Québécoise du cannabis), after grinding the leaves, the cannabinoids were extracted with 95% EtOH, after winterization at -20°C for 4 hours, the crude cannabinoids liquid sample was obtained after filtered through 0.22 µm membrane.

The cannabinoids liquid sample was injected into our SepaBean™ machine equipped with SepaFlash cartridge (UltraPure irregular C18, 40-63 μm, 60 Å, carbon content 17%, end-capped, surface area 500 m^2/g).

As shown in the graph below, the CBD is eluted around 4 mins, and the THC is eluted at 8 mins, with clear separation. Each fraction was further verified by LC-MS to be 99% pure. Eluent A is water, eluent B is EtOH, flow rate is set to be 20 ml/min, solvent gradient ranges 70%~100%.



As demonstrated here, our SepaBean™, automatic flash chromatography system is an excellent and efficient instrumental tool to purify CBD from Cannabis. It is equally effective for the purification of THC. This flash chromatography method is a simple, rapid and effective method for the isolation of key compounds in Cannabis.

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