

Cannabichromene Isolation Using Flash Chromatography

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Cannabichromene (CBC) is one of the four most abundant cannabinoids found in hemp along with cannabidiol (CBD), tetrahydrocannabinol (THC), and cannabigerol (CBG), (Pollastro, 2018). While it is in the top four, its concentration levels in extracts is typically low (<3%), similar to THC.

Reversed-phase flash chromatography is a useful technique to purify CBC and is the same technology used for THC remediation as well as THC and cannabiol (CBN) purification. However, THC and CBC are challenging to separate as their hydrophobicity differences are minimal, especially when compared to CBD and THC.

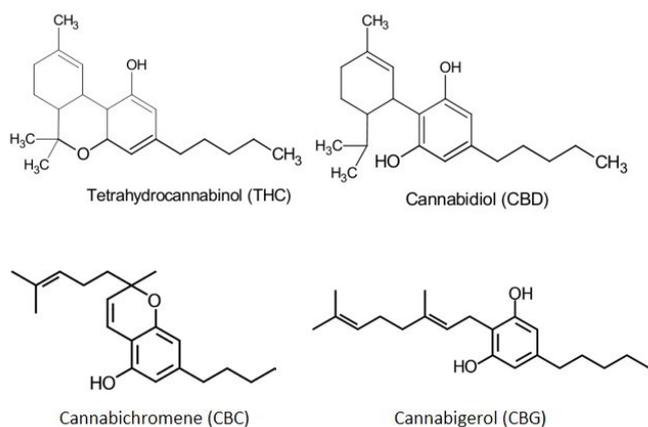


Figure 1. Chemical structures of the four most abundant cannabinoids. Both CBC and THC contain one -OH and one -O- functional group while CBD and CBG have two -OH groups but no -O- groups. The similarities between CBC/THC and CBD/CBG make each of these pairs challenging to separate.

Materials and Methods

System:	Biotage® Selekt with Spektra™
Column:	Biotage Sfär C18, 12 gram
Flow rate:	25 mL/min
Solvent A:	Water
Solvent B:	Methanol
Equilibration:	70% B for 2 CV
Gradient:	70% B for 3 CV 70–80% B in 0 CV 80% B for 3 CV 80–90% B in 0 CV 90% B for 3 CV 90–100% B in 0 CV 100% B for 3 CV
Detection:	Collect: λ -all 200–400 Monitor 231 nm, 207 nm

Results and Discussion

Because of the separation difficulty between THC and CBC, a multiple step gradient is required to maximize their separation.

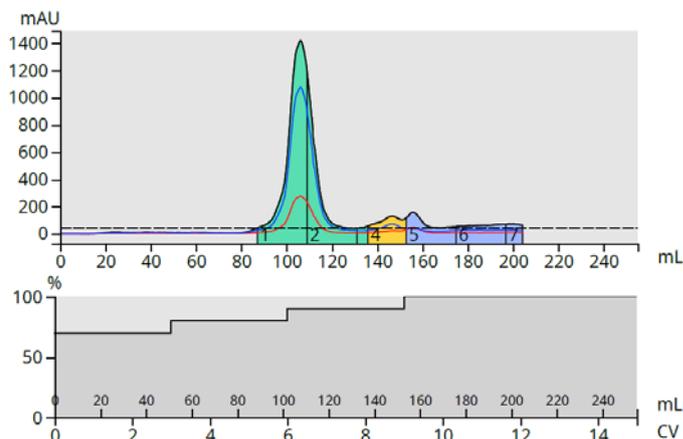


Figure 2. Hemp distillate CBC purification using a 4-step water/methanol gradient provides a separation of CBD (green), THC (yellow), and CBC (blue).

The Biotage® Selekt system's Spektra software enables enhanced UV detection sensitivity while providing qualitative cannabinoid identification by displaying each detected compound's UV spectrum. Since each cannabinoid has a different UV spectrum, this tool is helpful in compound identification. While CBD and THC have similar, but slightly different UV spectra, CBC is unique with strong UV absorbance at both 231 nm and 282 nm and minimal, low wavelength absorbance.

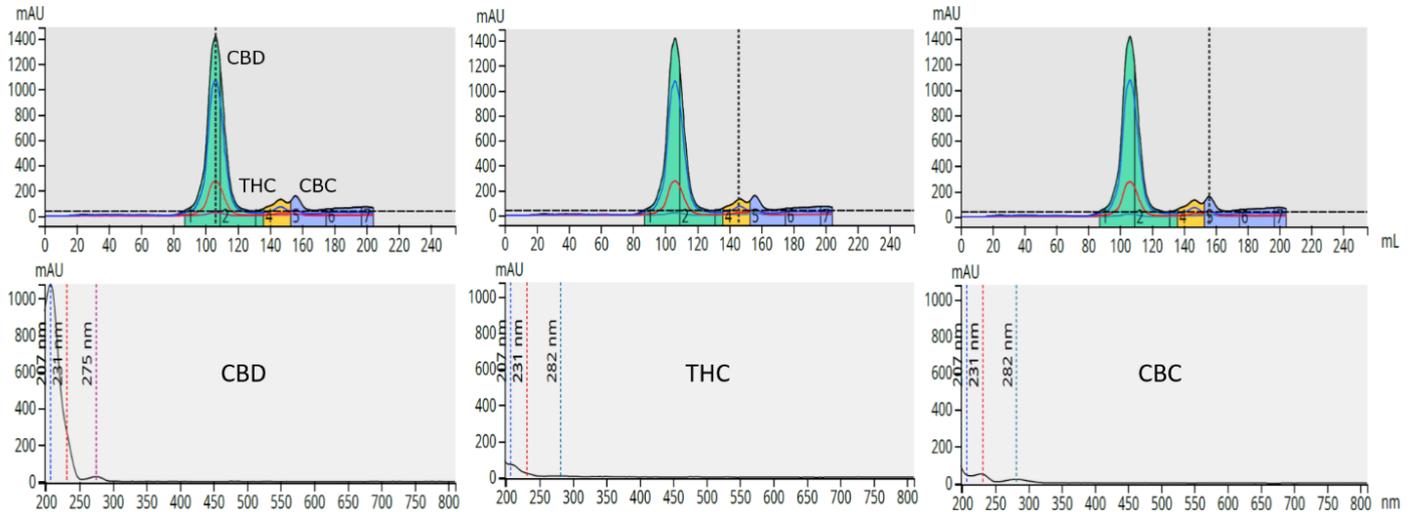


Figure 3. Selekt Spektra software provides qualitative compound identification. Left – CBD has three UV maxima. Middle – THC has three different UV maxima. Right – CBC has a totally different UV spectrum with strong absorbance at 231 nm.

Conclusion

Cannabichromene is challenging to purify but easy to recognize based on its unique UV spectrum.

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