APPLICATIONS



Quantification of 10 Cannabinoids in Cannabigerolic Acid (CBG-A) Dominant Cultivars by LC-UV

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Introduction



The increasing demands of the hemp industry on testing laboratories has created the need for a fast, efficient, and accurate quantification method for an increasing number of cannabinoids compared to previous needs of the marijuana dominant industry. In Oregon, more stringent Oregon Department of Agriculture regulations on dry weight tetrahydrocannabinol (THC) concentrations in pre-harvest hemp crops, as well as products intended for sale to consumers, have influenced the hemp market toward the cultivation of flowers that produce cannabigerolic acid (CBG-A) over cultivars that produce cannabidiolic acid (CBD-A). CBG-A dominant cultivars have shown lower total THC concentrations compared to CBD-A dominant cultivars and are sought after for their increased likelihood to pass total THC compliance testing. This shift in the hemp industry has led to the need for refinements in the way laboratories calibrate minor and major cannabinoids.

HPLC Parameters

Column:	Kinetex [®] 2.6 μm C18			
Dimension:	50 x 2.1 mm			
Part No.:	00B-4462-AN			
Mobile Phase:	A: 0.10 % Formic acid in water			
	B: 0.05 % Formic acid in methanol			
Injection Volume:	3 μL			
Detection:	UV @ 228 nm			
Flow Rate:	0.8 mL/min			
Gradient:	Time (min)	%A	%В	
	0	40	60	
	7	30	70	
	10.9	17	83	
	11	0	100	
	11.9	0	100	
	12	40	60	
	10	40	<u> </u>	

Figure 1: Ten analytes displayed at 100 µg/mL in just under 10 minutes





Analytes and Retention Times

Abbreviation	Name	RT (min)
CBD-V	Cannabidivarin	1.8
CBD-VA	Cannabidivarinic acid	2.4
CBD	Cannabidiol	3.9
CBG	Cannabigerol	4.4
CBD-A	Cannabidiolic acid	4.7
CBN	Cannabinol	5.6
CBG-A	Cannabigerolic acid	6.0
D9-THC	Δ9-Tetrahydrocannabinol	6.5
CBC	Cannabichromene	8.5
THC-A	Tetrahydrocannabinolic acid A	9.7

Figure 2: Six analytes (CBD, CBG, CBD-A, CBG-A, D9-THC, and THC-A) at 600 µg/mL with full resolution



Figure 3: CBG-A dominant hemp cultivar







Figure 4: Expanded 14 cannabinoid quantification profile using the same column in under 14 minutes

Results and Discussion

A major advantage to this method is the analytical range of 0.5 μ g/mL – 600 μ g/mL for THC-A, D9-THC, CBD-A, CBD, CBG-A, and CBG and 0.5 μ g/mL – 100 μ g/mL for CBC, CBN, CBD-VA, and CBD-V. This wide analytical range allows for fewer re-dilutions of samples containing what were once considered minor cannabinoids; most notably CBG-A dominant hemp cultivars. This method has proven its efficacy and reliability during the harvest season of 2019.

As the hemp industry continues to grow and the demands of producers and processors continue to change, the need for detection and quantification of an even larger number of minor cannabinoids will increase. At EVIO, Inc., work is currently being done to expand this method to quantify four additional analytes (THC-VA, THC-V, CBC-A, and D8-THC). This application note is written by Stephanie Moon and Adam Williams of EVIO, Inc. and published by Phenomenex, Inc.



PLICATIONS

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