

Potency Calculation and Reporting of 21 Cannabinoids in LabSolutions using the Cannabis Analyzer for Potency™

Abstract:

Many customers have generated data files for both dry sample and tincture, using the LabSolutions software. This document guides you through producing the reports. Data files which have been acquired via LabSolutions can be reprocessed using LabSolutions PostRun batch. The potency for dry sample is reported in wt.%, those values for the tincture can be calculated in mg/mL.

Keywords: Potency, Cannabis Analyzer, LabSolutions

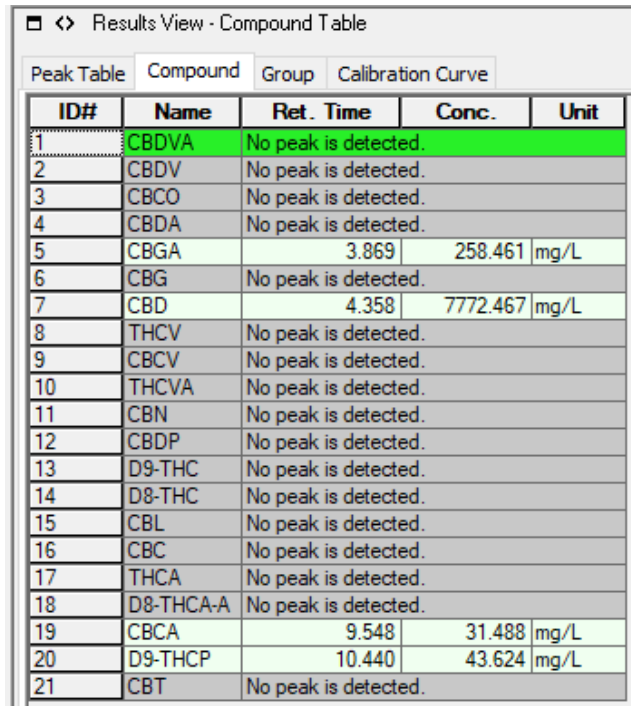
1. Measure the cannabinoids in dry-sample concentration in mg/L for 21 cannabinoids separation

The concentration in mg/L of the concentrated sample can be calculated for dry sample. This is not considered potency but could be useful. The data file should be re-processed in a PostRun batch file (figure

1) where the user enters a sample amount 1, and a Dil. Factor, in this case, equal to the sample dilution. The resulting data file will automatically calculate the mg/L of the concentrated dry sample (figure 2).

Postrun	Sample Name	Sample Type	Method File	Data File	Level#	Dil. Factor	Sample Amt.
1	Dry Hemp_8272020	0:Unknown	HighSensitivityMethod_21CRM.lcm	Dry Hemp_8272020.lcd	0	100	1

Figure 1: PostRun batch



ID#	Name	Ret. Time	Conc.	Unit
1	CBDVA	No peak is detected.		
2	CBDV	No peak is detected.		
3	CBCO	No peak is detected.		
4	CBDA	No peak is detected.		
5	CBGA	3.869	258.461	mg/L
6	CBG	No peak is detected.		
7	CBD	4.358	7772.467	mg/L
8	THCV	No peak is detected.		
9	CBCV	No peak is detected.		
10	THCVA	No peak is detected.		
11	CBN	No peak is detected.		
12	CBDP	No peak is detected.		
13	D9-THC	No peak is detected.		
14	D8-THC	No peak is detected.		
15	CBL	No peak is detected.		
16	CBC	No peak is detected.		
17	THCA	No peak is detected.		
18	D8-THCA-A	No peak is detected.		
19	CBCA	9.548	31.488	mg/L
20	D9-THCP	10.440	43.624	mg/L
21	CBT	No peak is detected.		

Figure 2: Measure concentration in the data file

2. Measure the concentration in wt.% or potency calculation dry sample for 21 cannabinoids separation

The displayed unit in the method file should be corrected by changing the "Unit" to "%" in the Method View and the Method File should be saved (figure 3).

Figure 4 shows that, for the dry sample only, using equations (1) and (2) below, the total amount of THC (contributions from d9-THC and THCA) can be determined on dry weight basis. Similar equations can be used to calculate the total CBD (contributions from CBD and CBDA). These equations can be edited by the user when reporting the potency for dry samples.

Individual cannabinoid (wt. %) percentage or potency for dry basis can be calculated using equation (3). These calculations can be performed in LabSolutions by adding the Dilution Factor. The Dilution Factor is calculated using equation (4) in Excel and the resulting value put into PostRun batch (figure 5). Figure 6 shows the reprocessed data file for the dry sample.

$$\text{Total THC (wt. \%)} = \text{Conc. d9-THC (wt. \%)} + (\text{Conc. THCA (wt. \%)} \times 0.877) \quad \dots [\text{Eq.1}]$$

$$\text{Total THC (mg/g)} = [\text{Conc. d9-THC (wt. \%)} + (\text{Conc. THCA (wt. \%)} \times 0.877)] \times 10 \quad \dots [\text{Eq.2}]$$

$$\text{Cannabinoid (wt. \%)} = \left(\frac{\text{Concentration of Component, ppm}}{\text{Sample Aliquot, mg}} \right) \left(\frac{\text{Extraction Vol, mL}}{\text{Additional Dilution Factor}} \right) \left(\frac{\text{Conversion mL to L}}{\text{mL to L}} \right) \cdot 100 \quad \dots [\text{Eq.3}]$$

$$\text{Dil. Factor} = (\text{Extraction Vol, mL}) \left(\frac{\text{Additional Dilution Factor}}{\text{Factor}} \right) (1/1000) \cdot 100 \quad \dots [\text{Eq.4}]$$

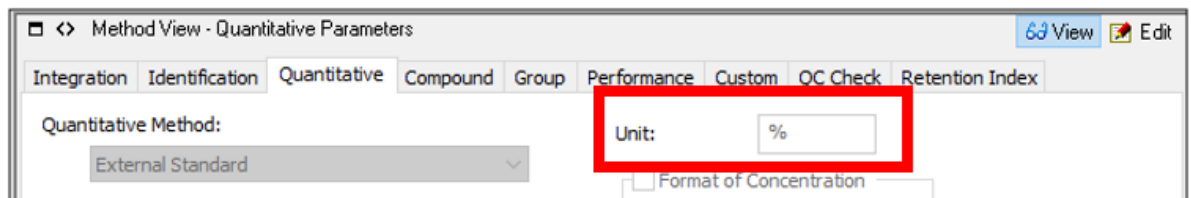


Figure 3: The symbol % in method file

	Title	Formula	Const A	Const B	Const C
1	Total CBD (%)	(Conc[7]+(Conc[4]*0.877))	1	1	1
2	Total THC (%)	(Conc[13]+(Conc[17]*0.877))	1	1	1
3	Total CBD (mg/g)	(Conc[7]+(Conc[4]*0.877))*10	1	1	1
4	Total THC (mg/g)	(Conc[13]+(Conc[17]*0.877))*10	1	1	1
5	Dry weight %	Conc*100	1	1	1

Figure 4: Custom parameters in method file

Postrun	Sample Name	Sample Type	Method File	Data File	Level#	Dil. Factor	Sample Amt.
1	Dry Hemp_8272020	0:Unknown	HighSensitivityMethod_21CRM.lcm	Dry Hemp_8272020.lcd	0	100	102

Figure 5: PostRun batch

ID#	Name	Ret. Time	Conc.	Unit	Total CBD (%)	Total d9-THC (%)	Total CBD (mg/g)	Total d9-THC (mg/g)	Dry weight %
1	CBDVA	No peak is detected.							
2	CBDV	No peak is detected.							
3	CBCO	No peak is detected.							
4	CBDVA	No peak is detected.							
5	CBGA	3.869	2.534 %		76.20066	0.00000	762.00661	0.00000	253.39279
6	CBG	No peak is detected.							
7	CBD	4.358	76.201 %		76.20066	0.00000	762.00661	0.00000	7620.06607
8	THCV	No peak is detected.							
9	CBCV	No peak is detected.							
10	THCVA	No peak is detected.							
11	CBN	No peak is detected.							
12	CBDP	No peak is detected.							
13	D9-THC	No peak is detected.							
14	D8-THC	No peak is detected.							
15	CBL	No peak is detected.							
16	CBC	No peak is detected.							
17	THCA	No peak is detected.							
18	D8-THCA-A	No peak is detected.							
19	CBCA	9.548	0.309 %		76.20066	0.00000	762.00661	0.00000	30.87014
20	D9-THCP	10.440	0.428 %		76.20066	0.00000	762.00661	0.00000	42.76853
21	CBT	No peak is detected.							

Figure 6: Measure concentration in the data file

At this point, the Report Template needs to be edited. In the Properties of the Quantitative Results remove "Custom Parameter 5" from the right side of the screen and add "Conc." and "Unit" then press OK.

Table 1 shows the summary of the results and figure 8 shows the generated dry sample report in LabSolutions.

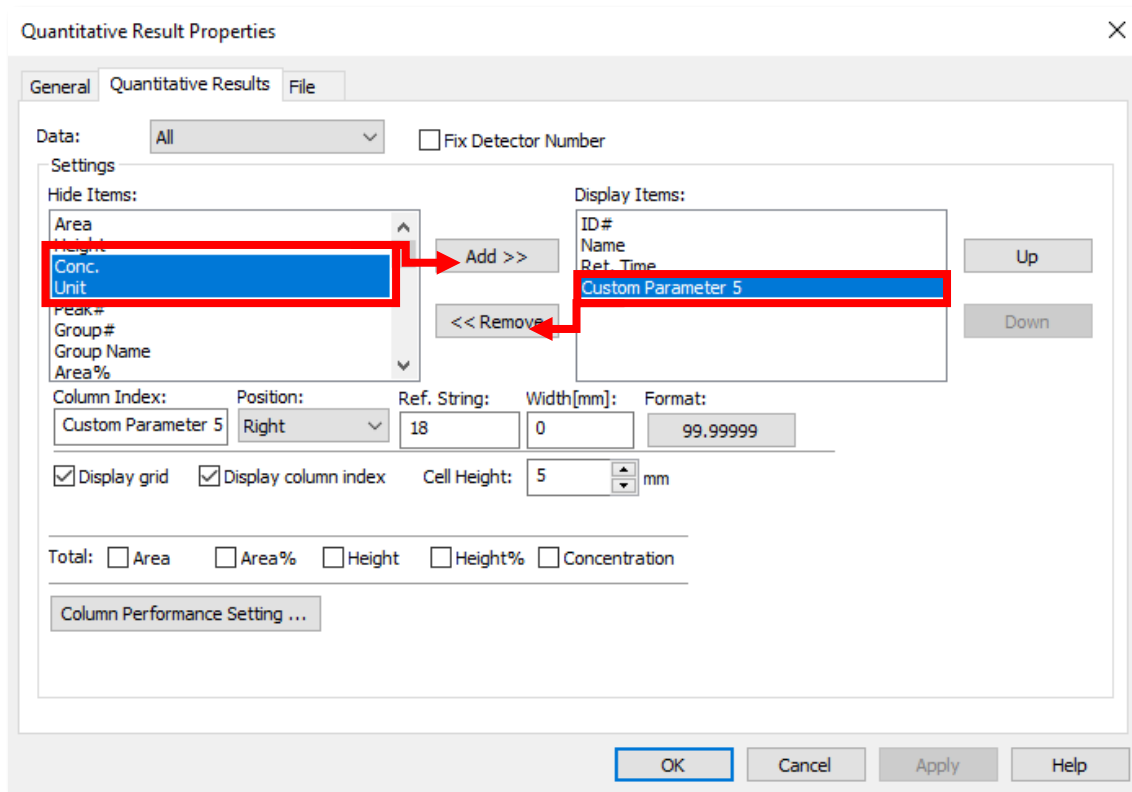


Figure 7: Editing the report template for dry sample

Table 1: Summary of parts I and II in excel. Measured potency for dry hemp flower

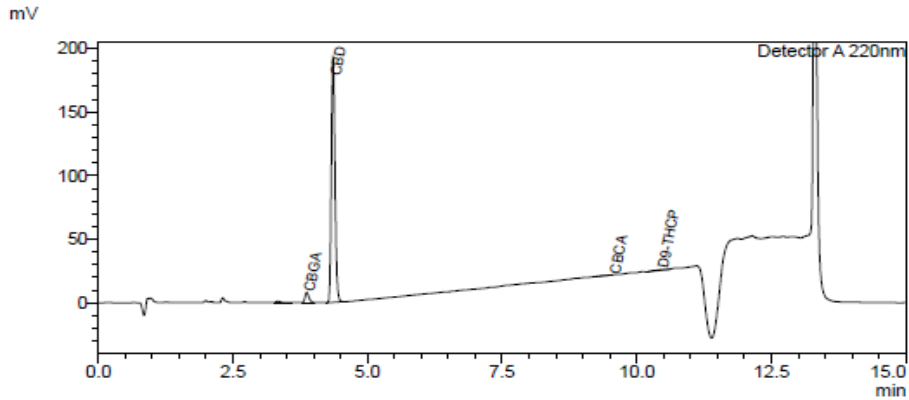
Compound	Conc. (mg/L)	Conc. (wt.%)	Total CBD (%)	Total CBD (mg/g)
CBGA	258.4	2.534	-	-
CBD	7772.4	76.201	76.20	762.00
CBCA	31.4	0.309	-	-
D9-THCP	43.6	0.428	-	-



<Sample Information>

System Administrator
 Sample Name : Dry Hemp-8272020
 Sample ID : 001
 Data Filename : Dry Hemp_8272020.lcd
 Method Filename : HighSensitivityMethod_21CRM.lcm
 Batch Filename : reprocessing Dry Hemp results were from LabSolutions makign a report from the dry sa
 Vial # : 1-17 Sample Type : Unknown
 Injection Volume : 5 uL
 Sample Amount : 102 mg
 Dilution Factor : 100
 Date Acquired : 8/28/2020 1:25:42 PM Acquired by : System Administrator
 Date Processed : 10/20/2020 3:04:27 PM Processed by : System Administrator

<Chromatogram>



<Quantitative Results>

Detector A				
ID#	Name	Ret. Time	Conc.	Unit
1	CBDVA	-	-	%
2	CBDV	-	-	%
3	CBCO	-	-	%
4	CBDA	-	-	%
5	CBGA	3.869	2.534	%
6	CBG	-	-	%
7	CBD	4.358	76.201	%
8	THCV	-	-	%
9	CBCV	-	-	%
10	THCVA	-	-	%
11	CBN	-	-	%
12	CBDP	-	-	%
13	D9-THC	-	-	%
14	D8-THC	-	-	%
15	CBL	-	-	%
16	CBC	-	-	%
17	THCA	-	-	%
18	D8-THCA-A	-	-	%
19	CBCA	9.548	0.309	%
20	D9-THCP	10.440	0.428	%
21	CBT	-	-	%

Total THC	0.00	%
Total THC	0.00	mg/g
Total CBD	76.20	%
Total CBD	762.01	mg/g

Figure 8: Dry sample report generated in LabSolutions

3. Measure the potency in mg/mL for tincture for 21 cannabinoids separation

Figure 9 illustrates the modification in PostRun batch file which reprocesses the data file. From the Table style select the Dil. Factor, Sample Amt and Custom Parameters. Enter a sample amount 1 and a Dil. Factor 1. And from drop down menu for the Custom Parameters modify the formula as shown below to represent the calculations in mg/mL.

The constant A is the tincture sample dilution. In this case the tincture has been 1000 times diluted (A=1000). Figure 10 shows these calculations. Figure 11 illustrates the generated tincture report in LabSolutions.

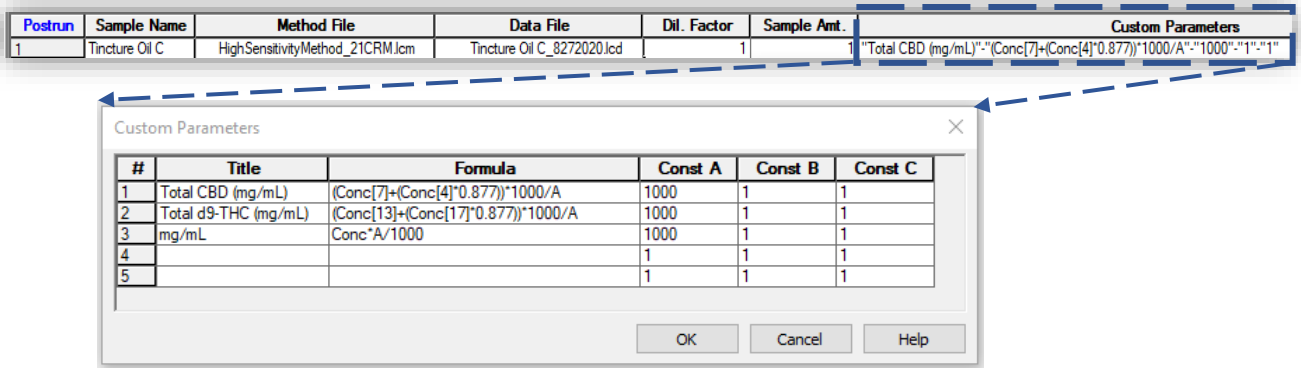


Figure 9: PostRun batch including the custom parameters for tincture

ID#	Name	Ret. Time	Conc.	Unit	Total CBD (mg/mL)	Total d9-THC (mg/mL)	mg/mL
1	CBDVA	No peak is detected.					
2	CBDV	No peak is detected.					
3	CBCO	No peak is detected.					
4	CBDA	3.649	0.276	mg/L	9.11895	3.25670	0.27618
5	CBGA	No peak is detected.					
6	CBG	4.153	0.274	mg/L	9.11895	3.25670	0.27427
7	CBD	4.351	8.877	mg/L	9.11895	3.25670	8.87675
8	THCV	4.529	4.433	mg/L	9.11895	3.25670	4.43270
9	CBCV	No peak is detected.					
10	THCVA	No peak is detected.					
11	CBN	6.176	0.140	mg/L	9.11895	3.25670	0.13989
12	CBDP	6.830	0.510	mg/L	9.11895	3.25670	0.50989
13	D9-THC	7.293	3.257	mg/L	9.11895	3.25670	3.25670
14	D8-THC	7.515	0.061	mg/L	9.11895	3.25670	0.06054
15	CBL	No peak is detected.					
16	CBC	8.451	0.145	mg/L	9.11895	3.25670	0.14499
17	THCA	8.795	0.000	mg/L	9.11895	3.25670	0.00000
18	D8-THCA-A	9.018	0.260	mg/L	9.11895	3.25670	0.25950
19	CBCA	9.548	0.199	mg/L	9.11895	3.25670	0.19895
20	D9-THCP	10.298	0.143	mg/L	9.11895	3.25670	0.14348
21	CBT	10.799	0.594	mg/L	9.11895	3.25670	0.59416

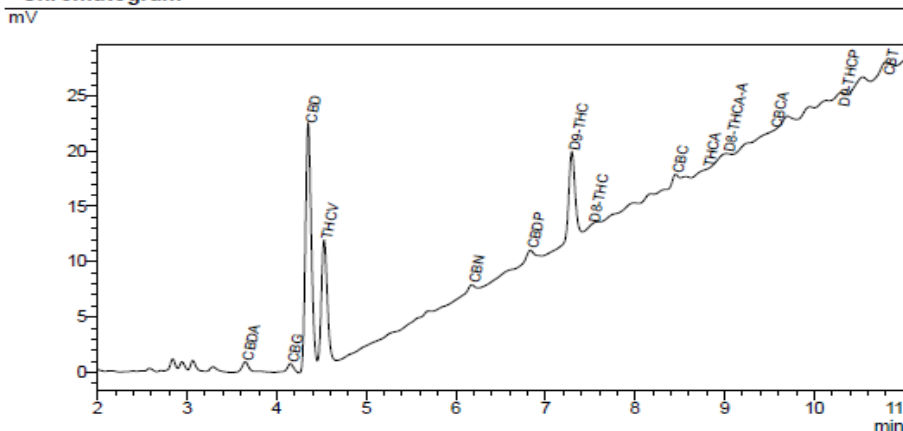
Figure 10: Measure concentration in the data file



<Sample Information>

System Administrator
 Sample Name : Tincture_Oil_C
 Sample ID : 001
 Data Filename : Tincture Oil C_8272020 - Copy (2).lcd
 Method Filename : HighSensitivityMethod_21CRM.lcm
 Vial # : 1-10
 Injection Volume : 5 uL
 Date Acquired : 8/28/2020 9:20:00 AM
 Date Processed : 10/6/2020 3:59:03 PM
 Sample Type : Unknown
 Acquired by : System Administrator
 Processed by : System Administrator

<Chromatogram>



<Quantitative Results>

Detector A			
ID#	Name	Ret. Time	mg/mL
1	CBDVA	--	0.00000
2	CBDV	--	0.00000
3	CBCO	--	0.00000
4	CBDA	3.649	0.27618
5	CBGA	--	0.00000
6	CBG	4.153	0.27427
7	CBD	4.351	8.87675
8	THCV	4.529	4.43270
9	CBCV	--	0.00000
10	THCVA	--	0.00000
11	CBN	6.176	0.13989
12	CBDP	6.830	0.50989
13	D9-THC	7.293	3.25670
14	D8-THC	7.515	0.06054
15	CBL	--	0.00000
16	CBC	8.451	0.14499
17	THCA	8.795	0.00000
18	D8-THCA-A	9.018	0.25950
19	CBCA	9.548	0.19895
20	D9-THCP	10.298	0.14348
21	CBT	10.799	0.59416

Total THC	3.26 mg/mL
Total CBD	9.12 mg/mL

Figure 11: Tincture report generated in LabSolutions

First Edition: October 2020



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