

CANNABIS HPLC



HPLC = HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

(the industry standard for cannabinoid analysis)

This revolutionary Cannabis HPLC is perfect for cannabis and hemp-grow facilities, bulk producers and processors, universities, pharmacies, and other companies that are looking for freedom to test their samples whenever they need without shipping and waiting for results from third party labs!

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THE FIRM BEHIND HPLC

CTInstruments is part of a movement to provide widespread access to accurate and low-cost instruments that help boost good practices and retain customer confidence in the industry by improving quality control, growing practices and genetics, extraction, blending and packaging processes, and inspection. CTInstruments' HPLC equipment, which offers proven accuracy and simplicity, is a revolution in the industry. It allows for testing to be accomplished in-house without a need for 3rd party commercial labs and at a fraction of typical costs.

WHY CHOOSE CANNABIS HPLC?

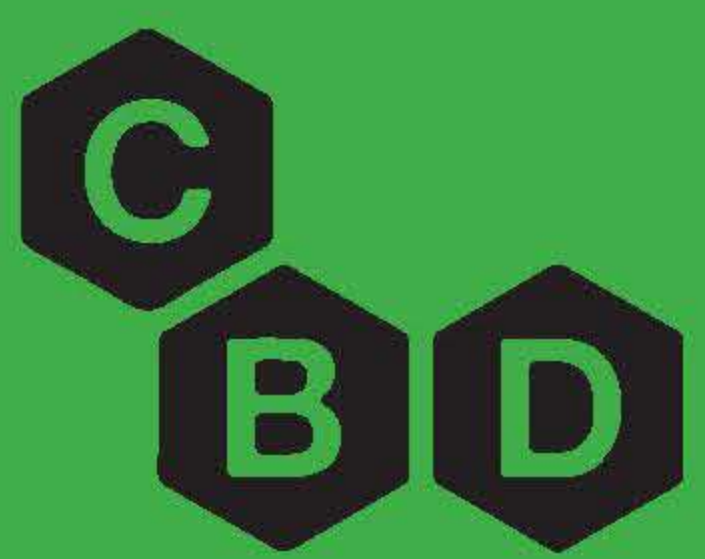
- ✓ Growers can determine the right harvest moment by taking multiple samples from the field to test instantly without lengthy waiting for lab results.



- ✓ Enjoy the freedom to test oils and extracts anytime during production!
- ✓ Easy sample preparation and COAs are ready within 15 - 20 minutes!
- ✓ Easily perform 15 - 20 tests in a working day!

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BENEFITS OF USING CANNABIS HPLC



CBD COMPANIES

Analyse your biomass, your production line and final product.



PHARMACIES

Double-check the quality of the products of suppliers before you sell it.



GROWERS

Never wait for lab results, perform your tests in-house.



COFFEE SHOPS & SOCIAL CLUBS

Provide your customers with up to date information of the products you sell.



BREEDERS

Make your selection process easier by testing everything in-house.



SEED COMPANIES

Provide accurate testing data with every seed you sell.



EXTRACTION COMPANIES

With fast, accurate in-house testing you generate valuable data in the process.

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WHAT IS INCLUDED



CANNABIS HPLC ANALYZER

- CTS-200 HPLC with temperature-controlled column compartment
- Calibrated 150mm C18 column with guard column holder and cartridge
- Accessories for installation and maintenance
- CTI HPLC software
- Testing methods with calibration curves
- Calibration log with quality control (QC) audit trail
- Sample receiving log
- Customer log
- Maintenance log
- Sample Preparation Protocols
- Standard Operating Procedure (SOP)
- Customizable Reporting System (Managed in MS Excel)
- Manual
- Online Training
- 10 hours of Consulting
- Technical Support



STARTER KIT

- Commercial calibration standards - D9-THC, CBD, 12 cannabinoids standard
- 1L HPLC buffer
- 1L HPLC grade Methanol
- 1L HPLC grade Acetonitrile
- 1L HPLC grade Water
- 3x100mL HPLC mobile phase bottle
- 1x500mL HPLC mobile phase bottle
- Advanced auto pipette with disposable pipette tips
- 100uL Hamilton microsyringe
- 2x5mL calibrated volumetric pipette
- 15mL calibrated volumetric pipette
- 20mL calibrated volumetric pipette
- 100mL calibrated volumetric flask
- Glassware
- 100x1.8mL autosampler vials with PTFE/silicone cap
- 100x16mL glass vial for extraction
- Precision digital analytical scale (0.0001g accuracy)
- Labels



COLUMN

- C18 HPLC column - 150x4.6mm, 5um
- C18 HPLC guard column

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HOW DOES IT WORK?

OIL SAMPLE PREPARATION

This example shows the exact process of preparing your sample for injection into the HPLC.



WEIGH SAMPLE

STEP 1 | Weigh 50-60 mg of sample with a precision scale



EXTRACTION

STEP 2 | Extract the sample in 15 mL of solvent



DILUTION

STEP 3 | Dilute the extracted sample with solvent



INJECTION

STEP 4 | Inject the diluted extract into the HPLC

EDIBLES | FLOWER | SHATTER | DISTILLATE | TOPICS | BEVERAGES | E-LIQUID | AND MORE...

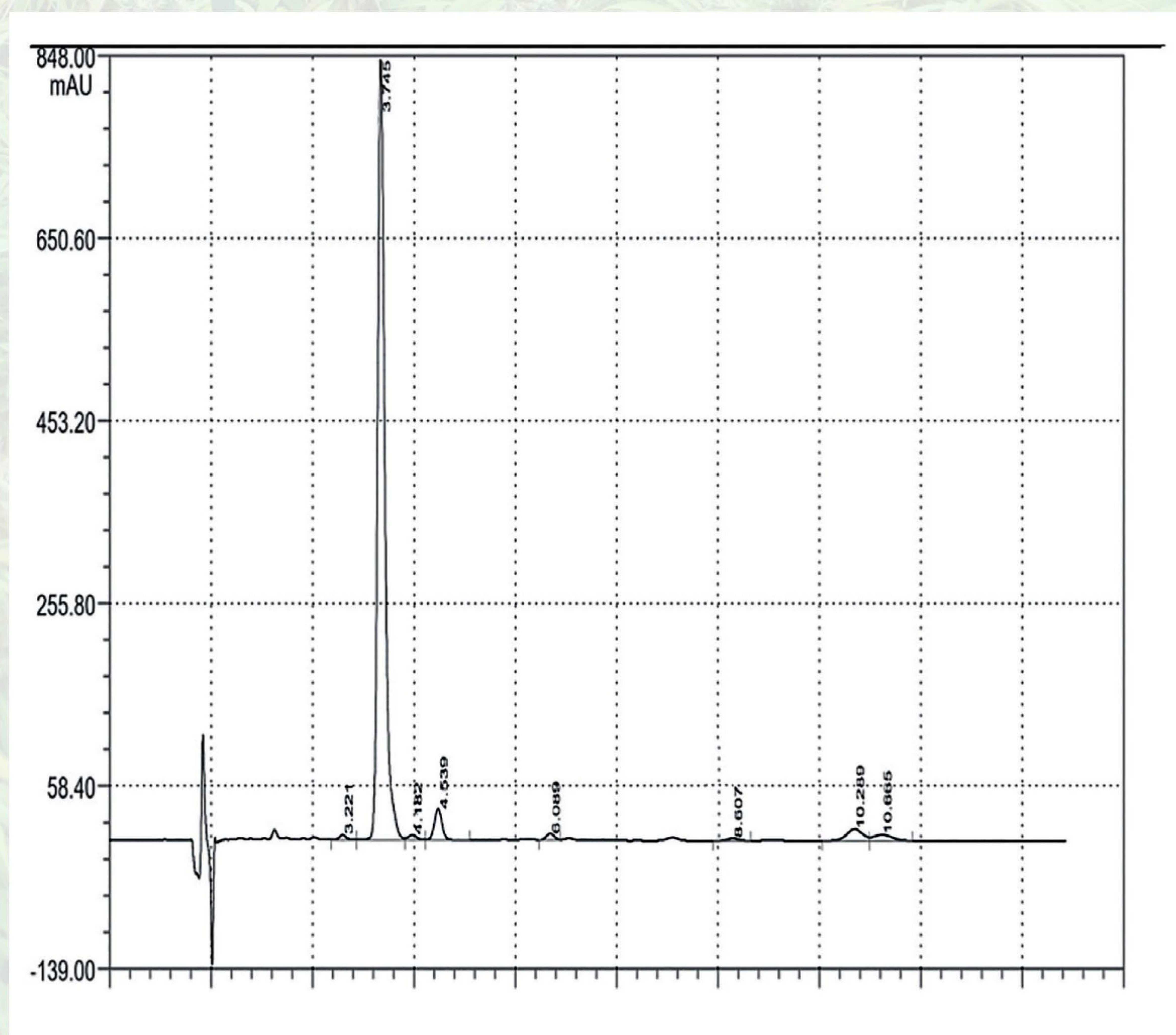
GENERATING A FULL CANNABINOID PROFILE

After you inject your sample into the HPLC, the software will start generating a chromatogram and COA covering 13 cannabinoids.

CANNABINOIDS

- CBDV
- CBDA
- CBD
- CBGA
- CBG
- THCVA
- THCV
- CBN
- CBL
- CBC
- d9-THCA
- d9-THC
- d8-THC


CHROMATOGRAM



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LOWER LIMIT OF QUANTIFICATION (LLOQ)

The lower limit of quantification LLOQ is the lowest amount of a cannabinoid or terpene in a sample that can be quantitatively determined with suitable precision and accuracy using the corresponding method and dilution rates. All values below this threshold are reported as less than LLOQ.



FLOWERS

13 cannabinoids
22 terpenes
LLOQ 0.03%
LLOQ of 0.001% available



CONCENTRATES

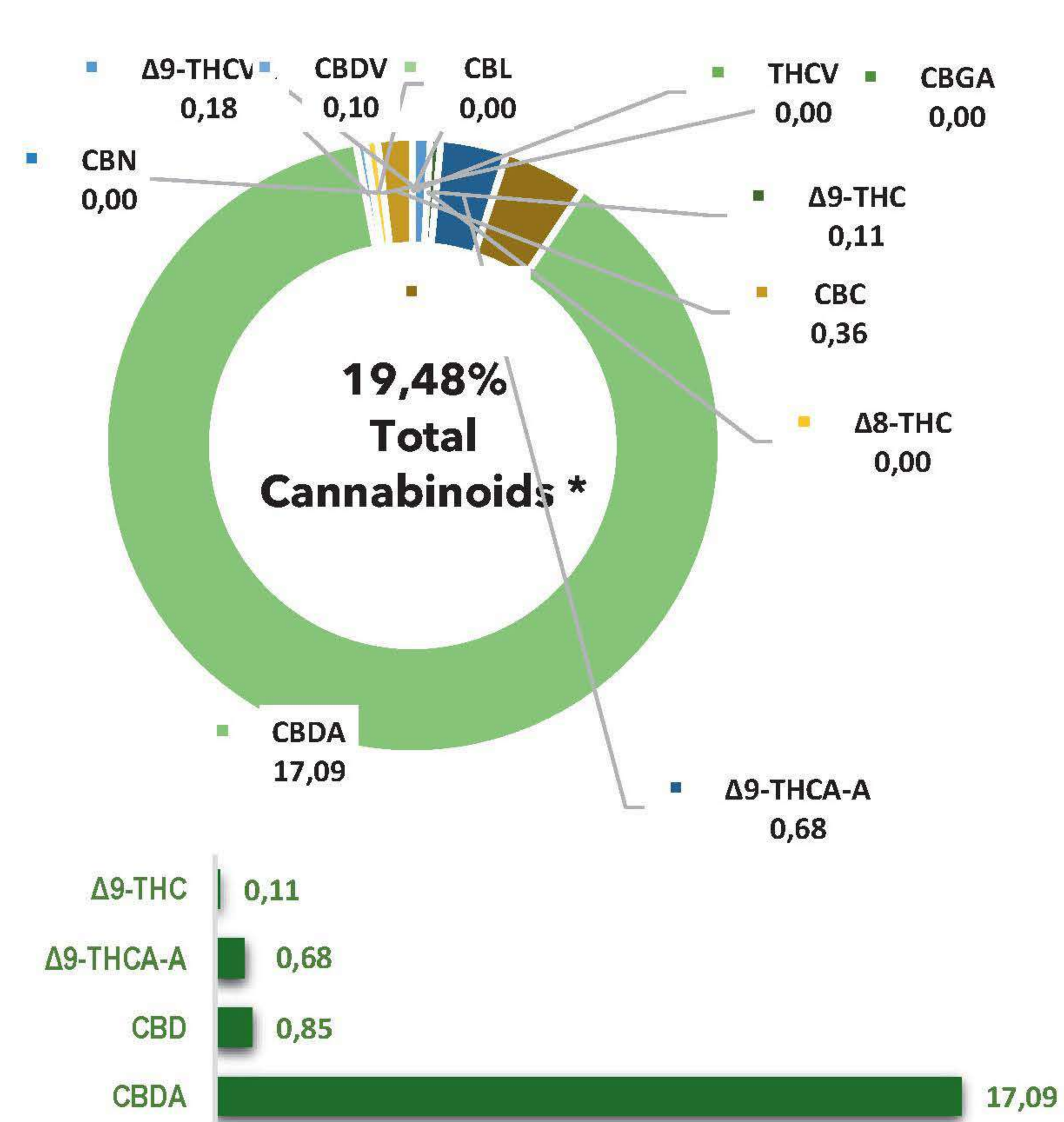
13 cannabinoids
22 terpenes
LLOQ 0.03% - 0.06%
LLOQ of 0.001% available

Detection limit of most cannabinoids is 0.03ug/mL (30ppb, 0.000003%)

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WITH THE INCLUDED CUSTOMIZABLE REPORTING SYSTEM (MANAGED IN MS EXCEL) IT'S VERY EASY TO CREATE YOUR OWN PERSONALIZED COA.

CANNABINOID PROFILE



Compound	Result (% w/w)	mg/gram of sample
THCV	NR	NR
Δ9-THCVA	0,18	1,79
Δ8-THC	NR	NR
Δ9-THC	0,11	1,07
Δ9-THCA-A	0,68	6,81
CBD	0,85	8,50
CBDA	17,09	170,88
CBDV	0,10	0,97
CBG	0,13	1,25
CBGA	NR	NR
CBN	NR	NR
CBC	0,36	3,55
CBL	NR	NR
Total Cannabinoids *	19,48	194,82
Total Potential THC	0,70	7,04
Total Potential CBD	15,84	158,40
Total Potential CBG	0,13	1,25

NOTES

* Total Cannabinoids = sum of all measured cannabinoids
 Total Potential THC = Δ9-THC + Δ9-THCA-A*0.877
 Total Potential CBD = CBD + CBDA*0.877
 NR = None Reported; Measured amount is below detection limit for the specified method

FINAL APPROVAL

Analyst Name:	FvL	QA Name:	OvL
Date:	19-May-22	Date:	19-May-22
Prepared By	FvL	Approved By	OvL

Testing results are based solely upon the sample submitted to Delta9 Analytics in the condition it was received. Delta9 Analytics warrants that all analytical work is conducted professionally in accordance with all applicable standard laboratory practices using validated methods. This report may not be reproduced, except in full, without the written approval.

7 | HPLC FEATURES

- ✓ Reciprocating Pump
- ✓ UV/VIS Detector
- ✓ Rheodyne 7725i Injector
- ✓ Temperature-controlled Column Compartment
- ✓ CTI HPLC Software



HPLC SPECS

- Max Pressure 6,300 psi
- Flow Accuracy $\leq \pm 1\%$
- Flow Precision RSD $< 0.1\%$ Qualitative
- Repeatability RSD $\leq 0.2\%$
(Naphthalene/Methanol standards)
- Quantitative Repeatability RSD $\leq 0.5\%$
(Naphthalene/Methanol standards)
- Wavelength Range 180 - 680nm
- Spectrum Bandwidth 8nm
- Wavelength Accuracy ± 1 nm
- Wavelength Precision Below 0.1nm
- Noise $\leq 0.25 \times 10^{-5}$ AU
- HPLC Column Specifications**
- Column Type C18, SS body
- Dimensions 150x4.6mm
- Packing 5 μ m particles
- Guard Column C18
- Chromatographic Conditions**
- Mode Isocratic
- Detection UV at 220nm

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CANNABIS HPLC CAN ANALYZE 13 MAJOR CANNABINOIDS

TOTAL THC, TOTAL CBD, TOTAL CBG, D9-THC, D8-THC, THCA, THCV, THCVA, CBD, CBDA, CBDV, CBG, CBGA, CBC, CBN, CBL

WHAT TYPES OF PRODUCTS CAN BE TESTED?

Flower, Concentrates, Hash, Rosin, Shatter, Wax, Oils, Tinctures, Topicals, E-liquids, Beverages, Edibles and more...

HOW ACCURATE IS THE CANNABIS HPLC?

We take the accuracy of our cannabis HPLC analyzer, validation of test methods, and sampling protocols extremely seriously. With our instrument, you will be operating like a certified professional lab. We have participated in the National Institute of Standards and Technology Cannabis Laboratory Quality Assurance Program, which compares testing of samples containing cannabinoids by around 140 laboratories across North America.

NRC HEMP – CERTIFIED REFERENCE MATERIAL STUDY

Measured Cannabinoids	CANNABIS HPLC	Mean value of 140 labs across North America	National Institute of Science and Technology (NIST)
d9-THC	0.0467%	0.0372%	0.0415%
THCA	0.1067%	0.0911%	0.109%
CBD	0.5367%	0.517%	0.584%
CBDA	1.607%	1.330%	1.560%
Total THC	0.1433%	0.111%	0.137%
Total CBD	1.947%	1.700%	1.970%

TESTING TERPENES

WE HAVE DEVELOPED A WORLD CLASS SOLUTION FOR TESTING TERPENES WITH CANNABIS HPLC.

FEATURES:

- Interference-free testing of terpenes in cannabis plants – no need to worry about interference between cannabinoids and terpenes
- Test for 28 major terpenes found in cannabis plants
- Simple sample preparation protocols
- Accurate and repeatable results
- Low detection limits
- Easy-to-generate customizable COAs

TYPES OF SAMPLES:

Cannabis plant, concentrates, essential oils
gin & alcoholic beverages, beer and more.

LIST OF TERPENES CANNABIS HPLC CAN ANALYZE

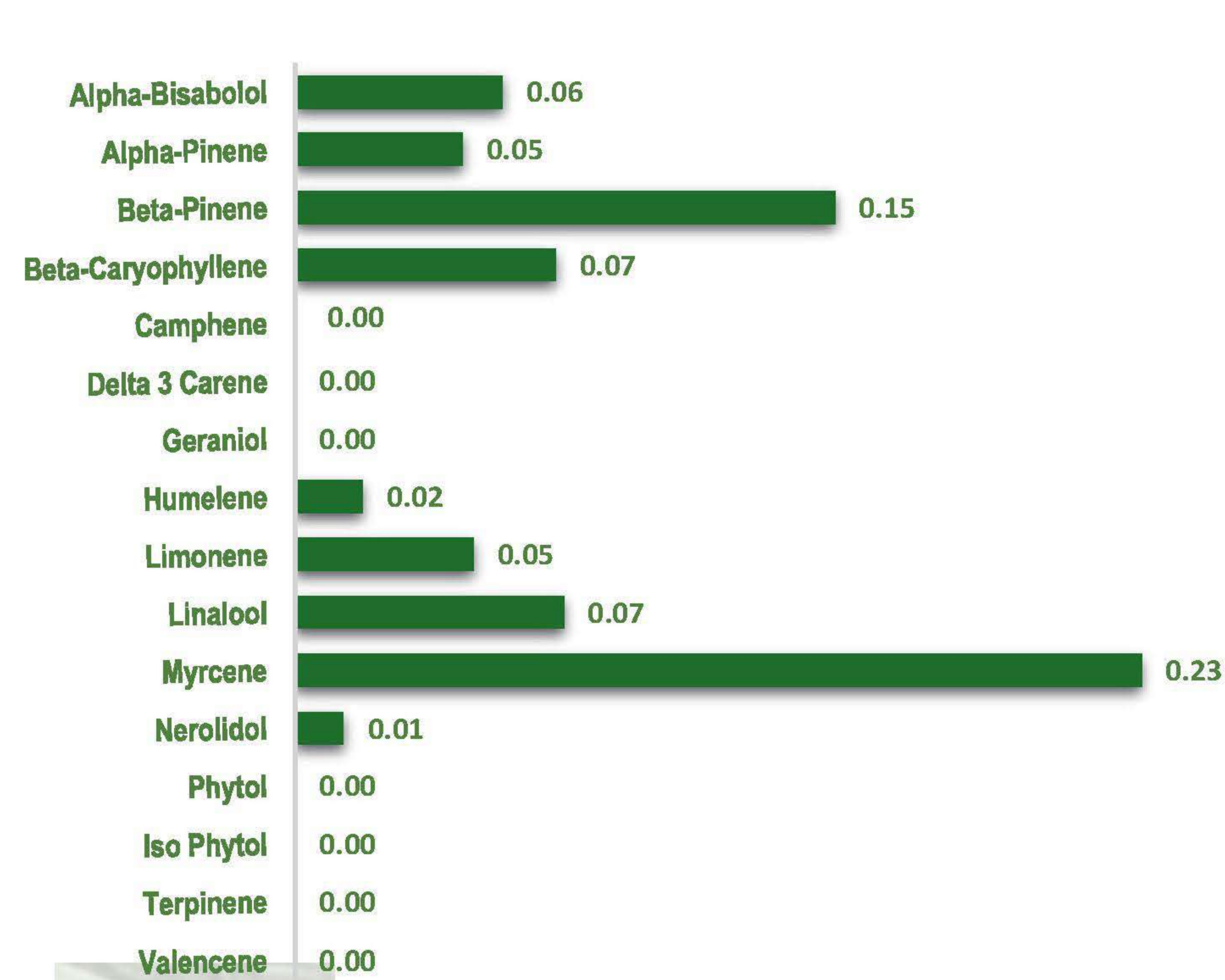
Alpha-Bisabolol	Eucalyptol	Cis-Nerolidol
Alpha-Pinene	Eugenol	Ocimene
Beta-Pinene	Alpha - Farnesene	Phytol
Beta-Caryophyllene	Beta-Farnesene	Iso Phytol
Camphene	Geraniol	Alpha-Terpinene
Carvacol	Guaiol	Terpinolene
Citral	Humelene	Thymol
Citronellol	D-Limonene	Valencene
p-Cymene	Linalool	
Delta 3 Carene	Myrcene	

HPLC TERPENE COA

Sample Type: Flower
Sample Description: test 1
Sample TAG ID: 400380
Analysis Type: Terpenes

Date Received: 15-Jul-20
Test Date: 31-Mar-22
Test Method: HPLC-Terps
Sample Weight (mg): 242

TERPENE PROFILE



Terpene	Result (% w/w)
Alpha-Bisabolol	0.06
Alpha-Pinene	0.05
Beta-Pinene	0.15
Beta-Caryophyllene	0.07
Camphene	<0.01
Delta 3 Carene	<0.01
Geraniol	<0.01
Humelene	0.02
Limonene	0.05
Linalool	0.07
Myrcene	0.23
Nerolidol	0.01
Phytol	<0.01
Iso Phytol	<0.01
Terpinene	<0.01
Valencene	<0.01

Total Terpenes 0.70%

10 | AUTOMATION

We offer CANNABIS HPLC with a plug & play autosampler that can be easily added to the HPLC at any time once you grow your testing capacity needs.

FEATURES:

- ✓ Commercial lab-grade automated solution at unbeatable prices
- ✓ Significant time-saver – CANNABIS HPLC can be run unattended
- ✓ Easy-to-connect at any time – you can turn your manual CANNABIS HPLC into an automated testing system by adding our plug & play autosampler
- ✓ 45 samples capacity
- ✓ Intuitive autosampler management software
- ✓ Accurate and reproducible results
- ✓ Reliable design for long-term operation



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FEATURES AND REVIEWS

- ✓ Premium Customer service
- ✓ 7 days a week Whatsapp/phone Support!
- ✓ Instruction and Training videos
- ✓ Troubleshooting
- ✓ Remote support

- ✓ Convenience – perform in-house analyses
- ✓ Analyze plant, extracts, edibles, beverages
- ✓ Test 13 major cannabinoids and more...
- ✓ Test 28 terpenes
- ✓ Easy to follow instructions
- ✓ reliable performance
- ✓ Long-term use
- ✓ Accurate results
- ✓ Compact size (18x9x10.5 inch)
- ✓ Optimized for cost at around \$5/test

COMPARISON TABLE

	CANNABIS HPLC	SHIMADZU CANNABIS POTENCY ANALYZER	AGILENT 1220 INFINITY II LC SYSTEM
# of cannabinoids	13	11	11
# of terpenes	28	none	none
Type of sample tested	any	any	any
# of samples per 8 hours	36	48	48
Autosampler	Available	Standard	Standard
Accuracy	High	High	High
Cannabis industry expertise	Excellent	Excellent	Excellent
Price	\$	\$\$\$	\$\$\$



MALO, SWITZERLAND

THANK YOU FOR YOUR PROFESSIONALISM AND I WILL GET BACK TO YOU IF I HAVE ANY QUESTIONS.

December 16, 2021

CAL, USA

JUST WANTED TO GIVE YOU A LITTLE UPDATE AND LET YOU KNOW THAT I REALLY LIKE THIS TESTER! I RAN QUITE A FEW TESTS, ON ALL KINDS OF PRODUCTS AND FLOWER AND THE CONSISTENCY OF RESULTS IS AMAZING. I SHOW IT OFF AND BRAG ABOUT IT TO EVERYONE IN MY COMMUNITY.

April 2, 2021

JULIAN, CANADA

THE INSTRUMENT GOT CANNABINOIDS IN THE DRINK RIGHT ON THE NOSE. I AM CONFIDENT IN THE ACCURACY. THANKS FOR BRINGING IT OUT AND SHOWING US HOW IT WORKS. IT IS ETCHED INTO MY MEMORY.

July 22, 2021

SOME FREQUENTLY ASKED QUESTIONS

WARRANTY AND SERVICE

- The HPLC hardware has 1 year warranty.
- Changing the UV lamp, column and seals is easy and can be done on the spot.
- No need to ship the CANNABIS HPLC for service.
- Support and instruction videos are available.

INFORMATION ABOUT THE COLUMN?

Column Type C18, SS body - Dimensions 150x4.6mm.

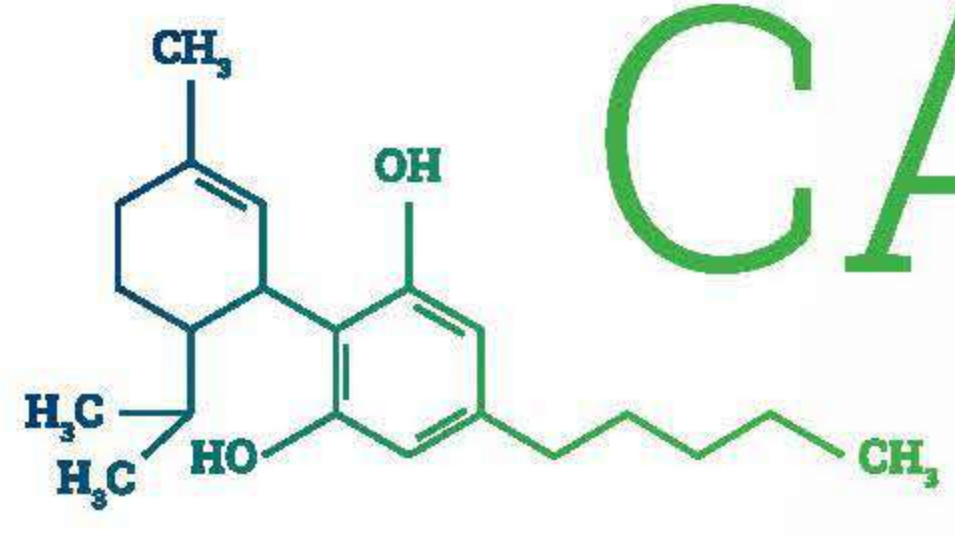
The price of a new column is ca. USD 900. New column is easy to install by yourself. The column is good for around 2000 injections.

IS THE MACHINE PLUG AND PLAY?

The machine itself is plug and play on a windows computer. You will receive all software and the excel log, which is linked to the software. However, getting to know the system and how the device works including sample preparation will require training. The manufacturer will provide you with 25 hours of video training/operating manuals/guides, etc.

HOW DO YOU CALIBRATE THE DEVICE? HOW MANY TIMES IT'S NEEDED ?

The instrument is calibrated before shipping and there is no further calibration needed. We test the instrument and column before shipping as part of our quality control. Then you will be checking commercial calibration standards – CBD, d9-THC, and benzoic acid to confirm everything passes. This is not a calibration, just checking or instrument validation. It will keep passing until at some point you need new standards because they are contaminated or decomposed (ca. 6 months), the column will need replacement (it is good for ca. 2,000 injections) if properly taken care of. There is no shipping back and forth, no calibrations. When you need a new column, we will send you one that we tested on cannabinoids.



CANNABIS HPLC



CT Instruments Ltd.

2022 Award Winner

CBD Product Testing
Solutions of the Year



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