CTInstruments

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CTInstruments Ltd. is a member of ASTM Committee D37 on Cannabis

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# Determination of 11 cannabinoids in Chocolate using $14,990 HPLC from CTInstruments

Accurate determination of cannabinoids in chocolate is important from pricing, quality assurance, and regulatory compliance point of view. We present an easy-to-use, accurate, reliable, and affordable HPLC for measuring 11 cannabinoids in a variety of samples. This application note describes analysis of cannabis edibles.

## HPLC Features

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

## HPLC Specifications

| | |
|---|---|
| **Flow Rate** | 0.001 - 5mL/min |
| **Max Pressure** | 6,300 psi |
| **Flow Accuracy** | ≤±1% |
| **Flow Precision** | RSD <0.1% |
| **Qualitative Repeatability** | RSD ≤0.2% (Naphthalene/ Methanol standards) |
| **Quantitative Repeatability** | RSD ≤0.5% (Naphthalene/ Methanol standards) |
| **Wavelength Range** | 180 – 680nm |
| **Spectrum Bandwidth** | 8nm |
| **Wavelength Accuracy** | ±1nm |
| **Wavelength Precision** | Below 0.1nm |
| **Noise** | ≤0.25X10$^{-5}$AU |

## HPLC Column Specifications

| | |
|---|---|
| **Column Type** | C18, SS body |
| **Dimensions** | 150x4.6mm |
| **Packing** | 5µm particles |
| **Guard Column** | C18 |

CTInstruments Ltd. Commercial Cannabis Awards 2020 – Best Cannabinoids Potency Testing Solutions Manufacturer - North America

**2020 COMMERCIAL CANNABIS AWARDS WINNER**

Best Cannabinoids Potency Testing Solutions Manufacturer - North America

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## Sample Information

| | |
|---|---|
| **Sample Type** | Chocolate |
| **Brand** | Bhang CBD Milk Chocolate 10.00 g |
| **Total THC per Unit** | 0.50 mg |
| **Total CBD per Unit** | 10.00 mg |

# PROCESS

## 1. Extraction

Extraction of cannabinoids from chocolate is the initial step in the analysis.

### Extraction Parameters

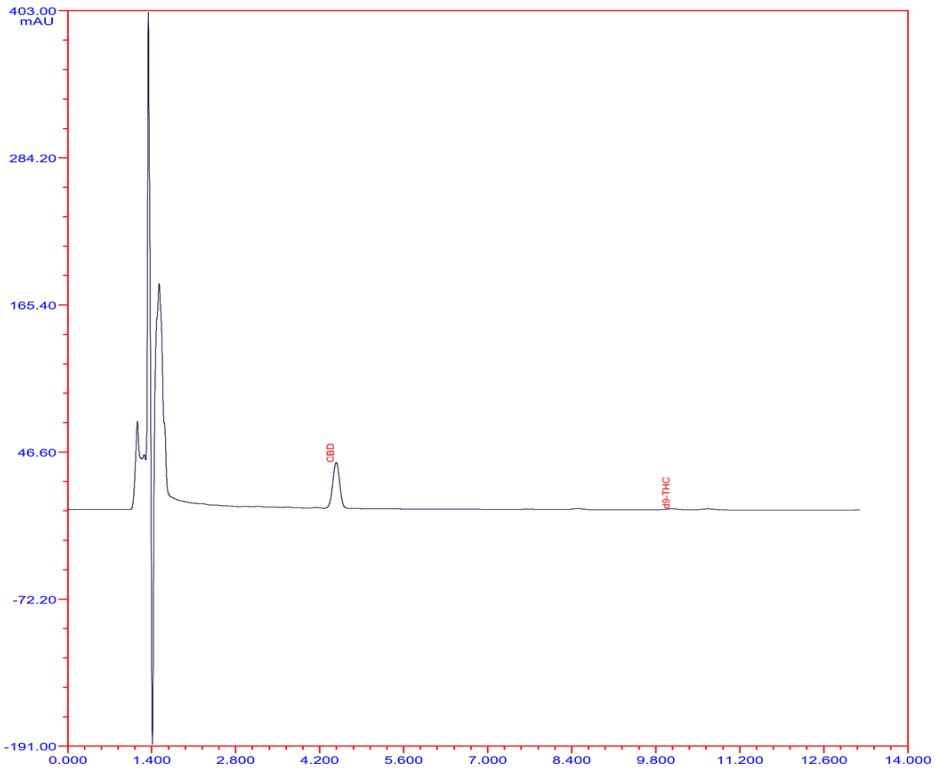
| | |
|---|---|
| **Sample Weight** | 70 mg |
| **Sample Preparation** | grating & sonication |
| **Extraction Solvent** | methanol |
| **Extraction Conditions** | room temperature |
| **Dilution** | in acetonitrile |

## 2. Injection and HPLC Analysis

After the extraction is completed, diluted extract is injected into HPLC for analysis.

### Chromatographic Conditions

| | |
|---|---|
| **Mode** | Isocratic |
| **Temperature** | 30°C |
| **Detection** | UV at 220nm |
| **Mobile Phase** | Buffer:Acetonitrile |
| **Flow Rate** | 1.2mL/min |

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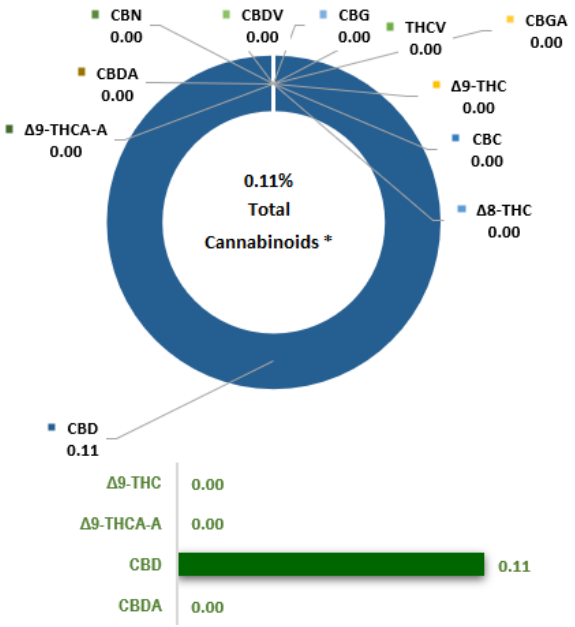
## 3. Report Generation

After the analysis is completed, CTI HPLC software auto-processes the chromatogram, followed by export to custom lab report generation program in MS Excel (highly customizable and automated report generation for ease of use).

CANNABINOID PROFILE




| Compound | | Result (%, w/w) | mg/gram of sample |
|---|---|---|---|
| THCV | Tetrahydrocannabivarin | NR | NR |
| Δ8-THC | (-)-Δ8-THC | NR | NR |
| Δ9-THC | (-)-Δ9-THC | <0.01 | <0.05 |
| Δ9-THCA-A | (-)-trans-Δ9-THC acid A | NR | NR |
| CBD | Cannabidiol | 0.11 | 1.07 |
| CBDA | Cannabidiolic acid | NR | NR |
| CBDV | Cannabidivarin | NR | NR |
| CBG | Cannabigerol | NR | NR |
| CBGA | Cannabigerolic acid | NR | NR |
| CBN | Cannabinol | NR | NR |
| CBC | (+/-) Cannabichromene | NR | NR |
| **Total Cannabinoids *** | | **0.11** | **1.07** |
| Total Potential THC | | <0.01 | 0.04 |
| Total Potential CBD | | 0.11 | 1.07 |
| Total Potential CBG | | <0.01 | <0.05 |

| Results | Manufacturer`s Values | Measured Values |
|---|---|---|
| **Total THC per Unit** | 0.50 mg | 0.40 mg |
| **Total CBD per Unit** | 10.00 mg | 10.70 mg |

### Lower Limit of Quantification (LLOQ)

The lower limit of quantification (LLOQ) is the lowest amount of a cannabinoid 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 NR - None Reported.

| Compound | | LLOQ (%, w/w) |
|---|---|---|
| THCV | Tetrahydrocannabivarin | 0.01 |
| Δ8-THC | (-)-Δ8-THC | 0.01 |
| Δ9-THC | (-)-Δ9-THC | 0.01 |
| Δ9-THCA-A | (-)-trans-Δ9-THC acid A | 0.01 |
| CBD | Cannabidiol | 0.01 |
| CBDA | Cannabidiolic acid | 0.01 |
| CBDV | Cannabidivarin | 0.01 |
| CBG | Cannabigerol | 0.01 |
| CBGA | Cannabigerolic acid | 0.01 |
| CBN | Cannabinol | 0.01 |
| CBC | (+/-) Cannabichromene | 0.01 |

### Instrument Calibration & Quality Control

| Date of Quality Control | Standard | Standard Concentration (ug/mL) | Measured Concentration (ug/mL) | Delta (%) | PASS/FAIL | Notes |
|---|---|---|---|---|---|---|
| 28-Jan-21 | Benzoic acid | 1002.9 | 1013.0 | 1.0% | PASS | |
| 28-Jan-21 | CBD | 100.5 | 103.4 | 2.9% | PASS | |