

Cannabis Testing Laboratory Solutions



We are the cannabis testing instrument experts.

From seed to sale, Shimadzu can provide you with reliable laboratory instruments. From accurate cannabis potency profiles to reliable, highly sensitive pesticide screening, let us deliver a scalable solution to meet your testing needs for today and tomorrow.



Cannabis growers benefit tremendously from cannabis testing. Whether meeting state requirements or certifying a product, laboratory testing reduces your risk and ensures delivery of a quality product. Routine cannabis testing services include potency, screening/determination of terpenes, and analysis of heavy metals, pesticides and residual solvents.

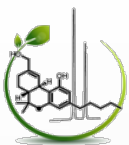


Shimadzu provides you with the leading cannabis testing analytical instrumentation. Our scientifically validated methods, expansive platforms and expert team of scientists are readily available to help your cannabis testing laboratory succeed. Talk to us today about your analytical testing needs.



As medicinal and recreational cannabis markets continue to grow, analytical testing will ensure that consumers are receiving accurately labeled products that are free from contamination. Shimadzu is ready to assist you as you grow your laboratory. We also offer instrument leasing (see page 11) to accelerate your business potential.

Delivering total cannabis lab testing solutions for:



Potency Testing

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Terpene Profiling

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Pesticide Screening

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Residual Solvents

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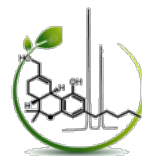
Heavy Metals

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Moisture Content

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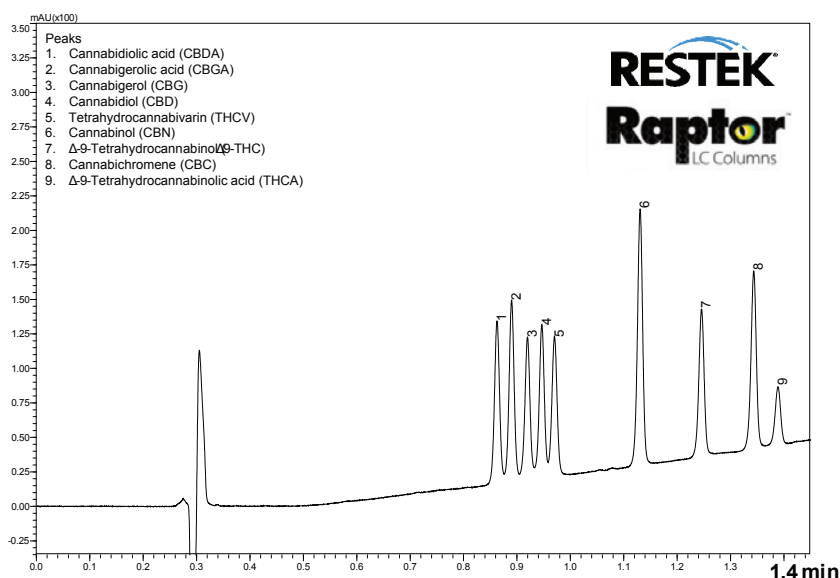


Potency Testing



Accurate determination of cannabinoid concentrations in cannabis samples is the most important component of cannabis testing. Shimadzu liquid chromatograph solutions deliver high accuracy for not only THC, but also a wide variety of other cannabinoids such as CBD, CBG, CBN and CBC.

Shimadzu is your partner for potency profiling. We provide the instrumentation and methods necessary to determine cannabinoid potencies in every sample, ranging from dry products to oils, waxes and edibles.



The Shimadzu i-Series family of liquid chromatographs (above, left) delivers maximum reliability and stability, automating cannabis potency profiles with exceptional ease. The Shimadzu i-Series can be paired with RESTEK Raptor LC columns (above, right) for ultrafast, accurate determinations.

Potency is measured in a wide variety of recreational and medicinal marijuana products ranging from dry products and beverages to edibles.

Please contact us for sample prep protocols.

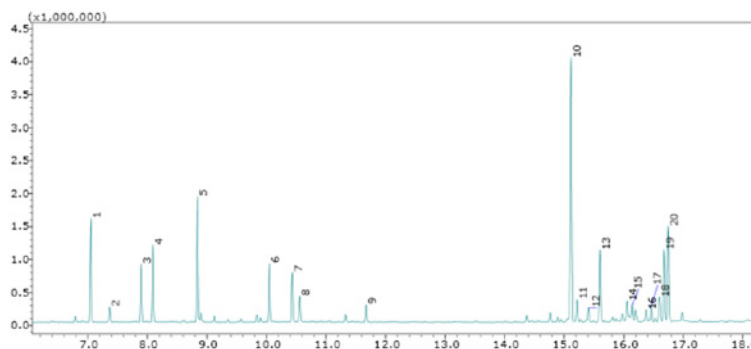




Terpene Profiling

Terpenes are produced in trichomes (where THC is produced) and give cannabis its distinctive flavor and aroma. Terpenes also act as essential, medicinal hydrocarbon building blocks, influencing the overall homeopathic effect. From the pine odor of pinene to the citrus-like smell of limonene, the characterization of terpenes and their synergistic effect with cannabinoids is easily achieved using Shimadzu GCMS.

The Shimadzu GCMS-QP2010 Ultra with HS-20 Head Space Sampler and NIST spectral library is the ultimate platform for terpene analysis. Easily identify over 3,000 flavor and fragrance compounds, to meet your terpene profiling needs.



Terpenes in Butane Hash Oil (BHO)



Shimadzu GCMS-QP2010 Ultra with HS-20



Pesticide Screening

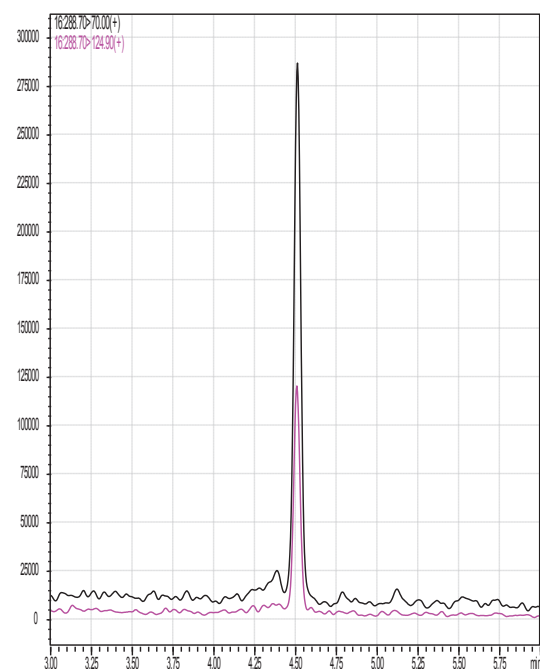
Pesticides are used in commercial cannabis grow operations to kill insects and spiders that thrive on cannabis plants. Pesticides are carcinogenic and mutagenic, causing serious harm to cannabis consumers, especially immuno-compromised medicinal cannabis users. Shimadzu offers the most sensitive and comprehensive pesticide screening and confirmation available.

The Shimadzu GCMS instruments enhance lab productivity and sample throughput. The systems' "twin-line" capability, unique to Shimadzu, enables installation and operation of more than one GC column, making the analysis of terpenes and pesticides possible on one instrument. The ecology mode saves power and carrier gas consumption, allowing for a lower cost of ownership.



Test for a wide variety of pesticides employed during cannabis cultivation, including:

- Organophosphates
- Carbamates
- Pyrethroids
- Avermectins.



10 ppb Myclobutanil



GCMS-QP2010 Ultra Single Quadrupole Mass Spectrometer



GCMS-TQ8040 Triple Quadrupole Mass Spectrometer

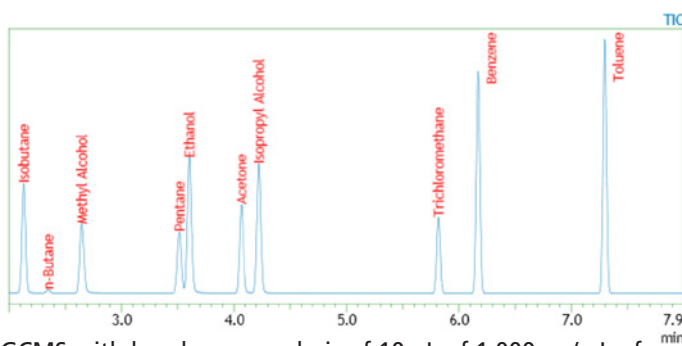


Residual Solvents



Residual solvents are leftover chemicals from the process used to extract cannabinoids and terpenes from the plant. The solvents are evaporated to prepare high-concentration oils and waxes. Sometimes, the evaporation process does not remove all of the solvent. Since these solvents are not safe for human consumption, it is important to verify their absence so you can guarantee you are providing a safe, chemical-free product.

The Shimadzu GCMS-QP2010 Ultra, with “twin-line” capability and a HS-20 headspace unit, enables rapid identification and quantitation of very low concentrations of residual solvents. Twin-line capabilities enable cannabis labs to run residual solvent (or terpene) analyses on the same instrument as pesticides.



GCMS with headspace analysis of 10 μ L of 1,000 μ g/mL of residual solvent standards



GCMS-QP2010 Ultra
with twin-line kit

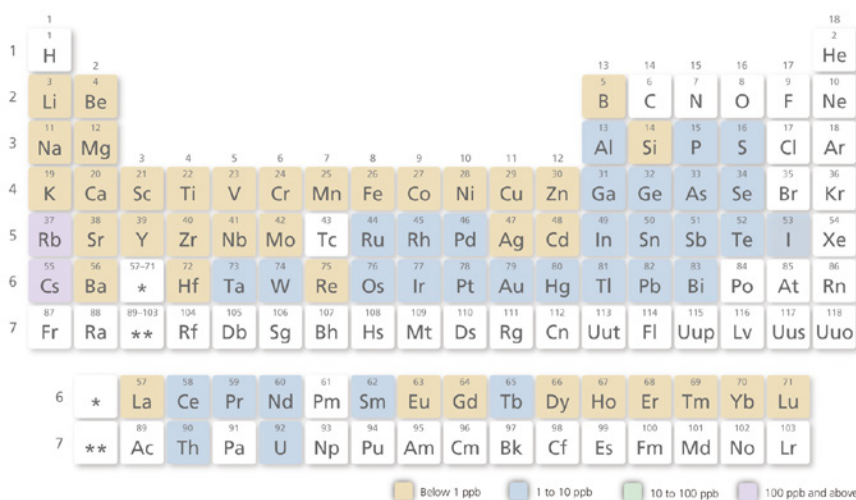


Heavy Metals Testing



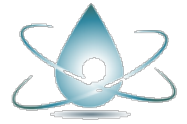
Metals occur both naturally and in contaminated soil and fertilizer. As cannabis plants grow, they take up metals from the soil. 'Heavy metals' are a group of metals considered to be toxic and include lead, cadmium, arsenic and mercury. Laboratory testing helps to ensure that your products are free from toxic concentrations of these hazardous metals.

There are several ways to determine trace metals in plant material, all requiring a preliminary acid digestion. Inductively Coupled Plasma with either Atomic Emission Spectroscopy (ICP-AES) or Mass Spectrometry (ICP-MS) methods are capable of rapidly analyzing all heavy metals. State requirements will determine which instrument you need. ICP-AES is the easiest to use, while ICP-MS is the most sensitive.



ICPE-9810 Simultaneous ICP Atomic Emission Spectrometer

Moisture Content & Precision Weighing



Moisture can be extremely detrimental to the quality of stored cannabis products. Dried cannabis typically has a moisture content of 10-12%. A moisture content above 12% is prone to mold growth.

The moisture content of a variety of cannabis samples can be measured using Shimadzu MOC63u (and MOC-120H) balances. The MOC63u is applicable to a variety of cannabis products and its' long-life and high-power halogen heater provides quick and accurate measurement.

We offer a complete line of balances, from top-loading to analytical.

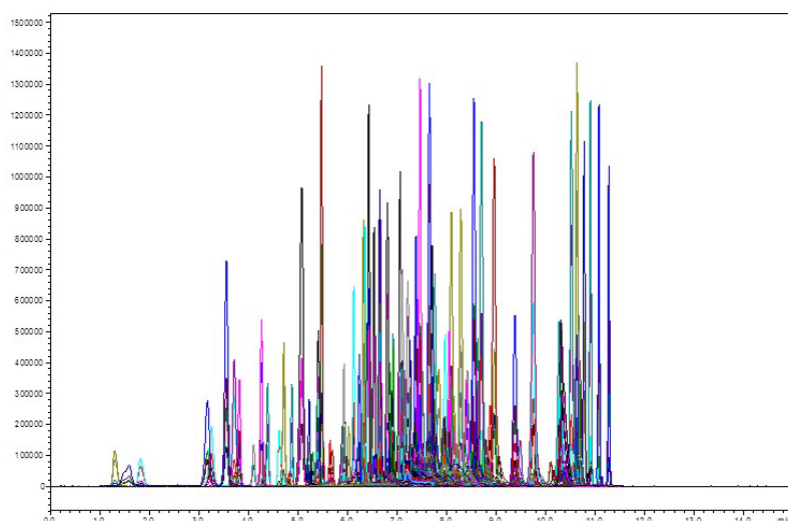


LCMS: The Versatile Cannabis Analytical Solution



Liquid Chromatograph-Mass Spectrometry (LC-MS) delivers ultra-high sensitivity and throughput for the most demanding cannabis testing applications, including trace-level cannabinoid quantitation and toxicological research.

We offer an array of qualitative and quantitative LC-based mass spectrometers, including easy-to-use single quadrupole mass spectrometers for rapid mass confirmation to sensitive and ultrafast triple quadrupole mass spectrometers for advanced quantitation. The ultra-low detection limits provided by LC-MS make this technique ideal for the analysis of pesticides, terpenes, and potencies.



High sensitivity LC-MS/MS analysis of 211 pesticides in cannabis dry product in under 12 minutes using a Shimadzu LCMS-8040 triple quadrupole mass spectrometer



LCMS-8040 Triple Quadrupole Mass Spectrometer



LCMS-2020 Single Quadrupole Mass Spectrometer



Shimadzu Financial Services

specializes in equipment leasing to corporations in the United States on transactions ranging from \$5,000 to \$2,500,000. Through a strong network of funding business partners, we offer one of the most complete Financial Programs in the country.

Shimadzu offers a variety of options for our customers including:

- Leasing for both new and used equipment
- Operating leases
- Rentals which help large companies that do not have capital budgets
- Capital leases



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