

Cannabis Testing 101 Outline : June 07-08, 2021

The Chemical Analysis of Cannabis plant-derived samples

I. Module 1 Sample Preparation

- a. Sample Collection
- b. Relevance of plant sample dry weight
- c. Extraction and sample preparation of plant samples for potency analysis
- d. Solid-phase extraction sample clean-up
- e. Knowledge check

II. Module 2: Introduction to GC/ HPLC and MS

- a. Gas chromatography (GC) instrumentation and applications
- b. High-performance liquid chromatography (HPLC) instrumentation and applications
- c. Mass spectrometry (MS) instrumentation and applications
- d. Relative merits of GC/FID, GC/MS, HPLC/UV and HPLC/MS
- e. Knowledge check

III. Module 3: Potency Determination Analysis Techniques

- a. Potency due to what?
- b. Relative merits of LC/UV, LC/MS and spectroscopic techniques
- c. Principles of quantitative analysis
 - i. Calibration curve
 - ii. Reference standards
 - iii. Internal standards
- d. Example applications
- e. Knowledge check

IV. Module 4: Pesticide Analyses

- a. Why pesticides? How many?
- b. Chemical diversity and detection limits required
- c. QUECHERS for sample preparation
- d. Tandem mass spectrometry
 - i. GC/MS/MS
 - ii. LC/MS/MS
 - iii. Example applications

- e. Knowledge check

V. Module 5: Terpene Analyses

- a. Why terpenes?
- b. Diversity of chemical structures
- c. Sample preparation
- d. Head space sample analysis
- e. Chemical analysis by GC techniques
- f. Knowledge check

VI. Module 6: Mold and Mycotoxin Determination

- a. Detection and identification of pathogens
- b. Mycotoxins
- c. Quantitative PCR (qPCR) principles of analysis
- d. Sample preparation
- e. Chemical analysis
- f. Knowledge check

VII. Module 7: Residual Solvents

- a. What is the problem?
- b. Sample collection/preparation
- c. Headspace analysis
- d. Solid-phase micro extraction (SPME)
- e. GC/FID vs. GC/MS
- f. Knowledge check

VIII. Module 8: Heavy Metals

- a. Sources of heavy metal elements
- b. Bioaccumulation by cannabis plants
- c. Sample preparation
- d. Inductively coupled plasma/mass spectrometry (ICP/MS)
- e. Importance of isotopes
- f. Knowledge check