

Automated Extraction of Tetrahydrocannabinol And Cannabidiol using VERSA 1100 SPE prior to GC-MS

This application note describes the use of VERSA 1100 solid-phase extraction (SPE) workstation for the extraction of tetrahydrocannabinol (THC) and cannabidiol (CBD) from urine matrices prior to gas chromatography-mass spectrometry (GC-MS) analysis.

Introduction

Cannabis use has increased globally for both medicinal and recreational purposes, leading to an increased need for accurate testing methods. One common method for testing is the analysis of urine samples for the presence of THC and CBD, two of the primary active compounds in cannabis. GC-MS is a commonly used technique for the analysis of these compounds. However, sample preparation is crucial for accurate and precise analysis. SPE is a commonly used technique for sample preparation prior to analysis. Aurora Biomed offers customized VERSA 1100 SPE workstations for increased efficiency, accuracy, and reproducibility compared to traditional manual SPE methods. This application note will describe the use of VERSA 1100 SPE for the extraction of THC and CBD from urine matrices prior to GC-MS analysis.

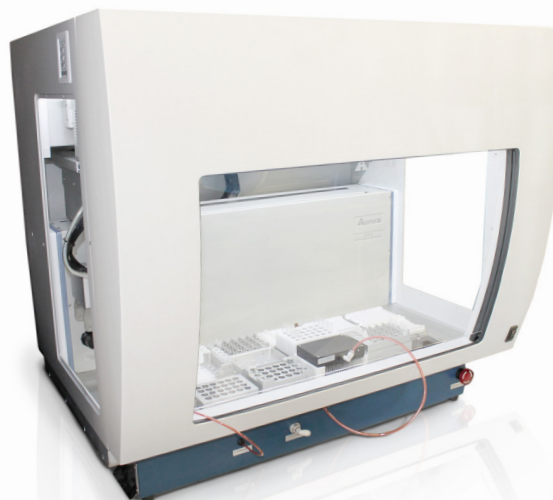


FIGURE 1. VERSA 1100 SPE

VERSA 1100 SPE FEATURES

- ✓ 4 or 8 channel pipetting head with single channel functionality offers enhanced versatility in liquid handling
- ✓ 5 to 8 channel ReagentDrop provides dispensing of bulk reagents without disposable pipette tips
- ✓ SPE decks compatible with 1, 3, and 6 mL cartridges as well as 96-well SPE cartridge plates
- ✓ Gripper transports modules for on-deck pressure application (positive or negative) and nitrogen drying
- ✓ Shaker-heater (RT to 90°C) for efficient sample pre-processing and derivatization
- ✓ UV HEPA filtered enclosure to minimize risk of sample contamination
- ✓ Open system allows for incorporation of third-party accessories and consumables
- ✓ Liquid-liquid extraction functionality available

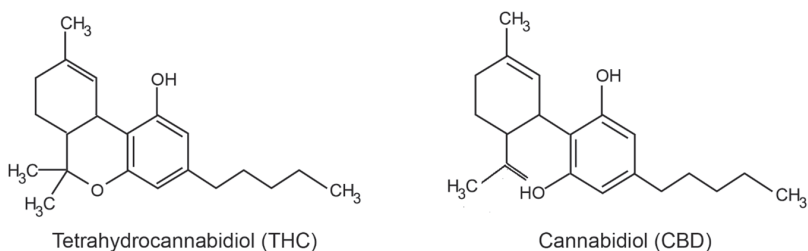


FIGURE 2. THC and CBD structure

Workflow chart

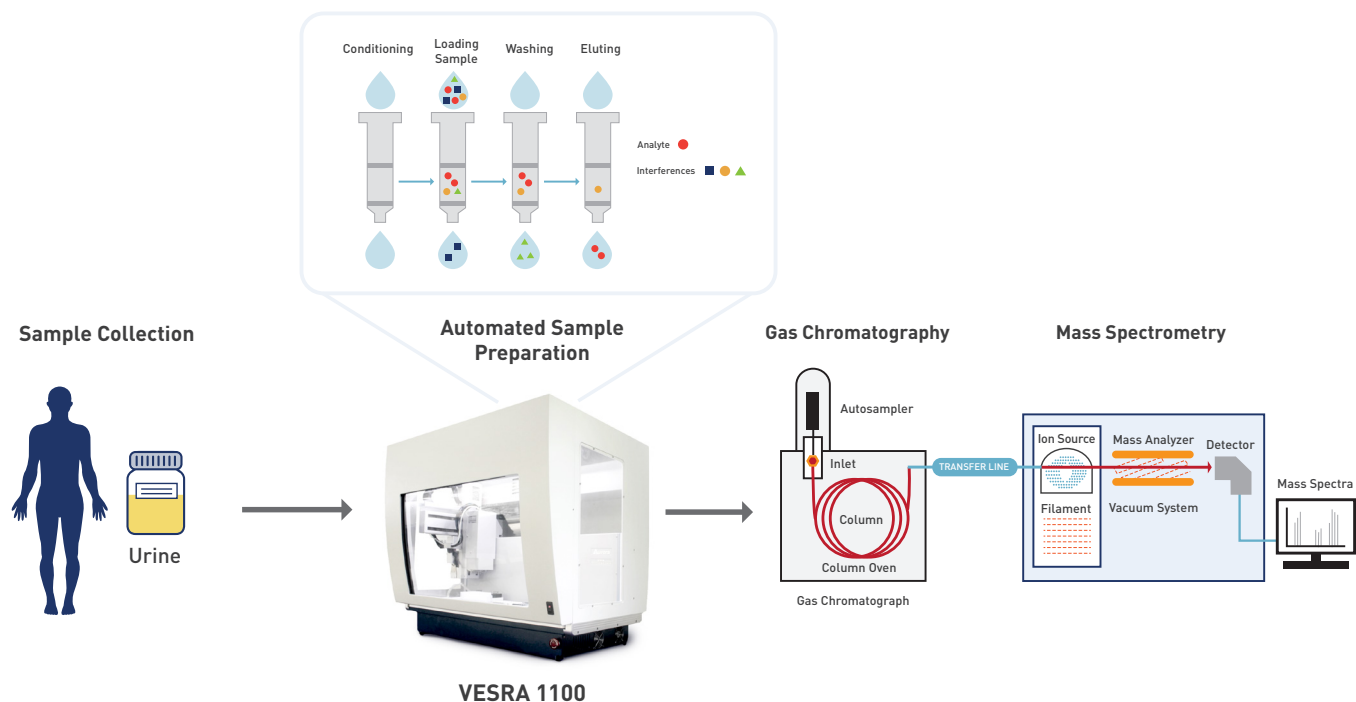


FIGURE 3. Workflow of THC and CBD using VERSA 1100 SPE and GC-MS

Experimental Steps

We used VERSA 1100 SPE for the automated extraction of THC and CBD from urine samples. The SPE module used Biotage Evolut cartridges. The following protocol was used for the extraction:

1. Condition the VERSA SPE cartridge with the recommended solvent.
2. Load 1 mL of urine sample onto the VERSA SPE cartridge.
3. Wash the cartridge with the recommended solvent to remove matrix interferences.
4. Elute the analytes from the cartridge using the recommended elution solvent. Dry columns for 3 minutes.
5. Evaporate the solvent using a centrifugal evaporator.
6. Reconstitute the dried extract with an appropriate solvent (e.g. hexane).
7. Inject the extract into the GC-MS system for analysis.