CAPSULES
preliminary notes and applications from Bioanalytical Systems, Inc.

Determination Of Δ^9-Tetrahydrocannabinol (THC)

Purpose

Determination of Δ^9-tetrahydrocannabinol (THC) in blood and saliva.

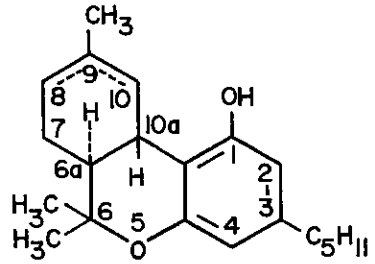

Figure 1. Structure of THC

THC (F1) is the psychoactive compound of the hemp plant *Cannabis sativa*. It is thus a drug of abuse in such preparations as marijuana, hashish, bhang and ganja. Physiological effects of THC include increased pulse rate, euphoria, and impaired memory, cognition and motor coordination. THC is used experimentally for the treatment of glaucoma and to relieve nausea and appetite loss associated with cancer chemotherapy. Sensitive assays are needed for forensic screening, therapeutic monitoring and pharmacokinetic studies.

Existing Methods

GC, GC-MS and radioimmunoassay. These are sensitive but may require rigorous sample preparation and are time consuming. LC is capable of separating THC from biofluids without extensive extraction, but UV detectors are not sufficiently sensitive.

Reference

Determination of Δ^9-Tetrahydrocannabinol in Human Blood and Saliva by High-Performance Liquid Chromatography with Amperometric Detection, L.K. Thompson and E.J. Cone, J. Chromatogr. 421 (1987) 91-97.

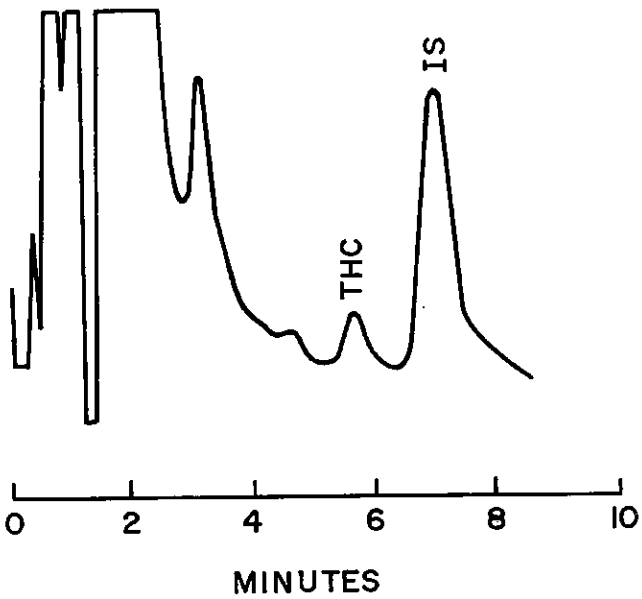

Figure 2. Chromatogram of saliva sample collected 2h after subject smoked a marijuana cigarette. THC content was 26.8 ng/mL. IS = internal standard (4-dodecylresorcinol).

Conditions

Detector: BAS LC-4B
Electrode: BAS glassy carbon
Potential: + 0.90 V vs Ag/AgCl
Column: C_{18} reverse-phase (150 x 3.9 mm)
Mobile Phase: 77.5% (v:v) 0.10 M sodium monochloroacetate, 0.025 M monochloroacetic acid; 22.5% methanol. Flow rate was 3.0 mL/min.
Detection Limit: 1 ng/mL plasma (S/N = 3), 0.5 ng injected
Linear Range: 1 - 150 ng/mL

Sample Preparation

THC was extracted from plasma, serum or saliva with methanol, then deproteinized with perchloric acid. After centrifugation the supernatant was mixed

with saturated sodium chloride and toluene, then re-centrifuged. The organic phase was removed for analysis.

Notes

THC eluted at 5.7 minutes (F2).

Recovery was 84% from spiked body fluids.

There was no chromatographic interference from 8 marijuana constituents and metabolites.

Two unknown peaks eluted after 4 hours. To prevent these late eluters from interfering with the analysis the column was washed with methanol (3 mL/min. for 15 min.) after every 12 samples, then re-equilibrated with mobile phase for 15 minutes. This procedure allowed an operator to perform 100 analyses per day.

The determination of THC presented in this report can be duplicated with the BAS 400 Liquid Chromatograph or the BAS 200 Problem Solver.

The information in this publication is supplied as a service to our customers. Performance of the methodology has not necessarily been verified by BAS technical staff.