

Cannabinoid Mixture Analysis with a Compact LC-MS System



Key Words



Cannabinoid analysis



Small-footprint mass spectrometry and liquid chromatography



Cannabis product authentication



OVERVIEW

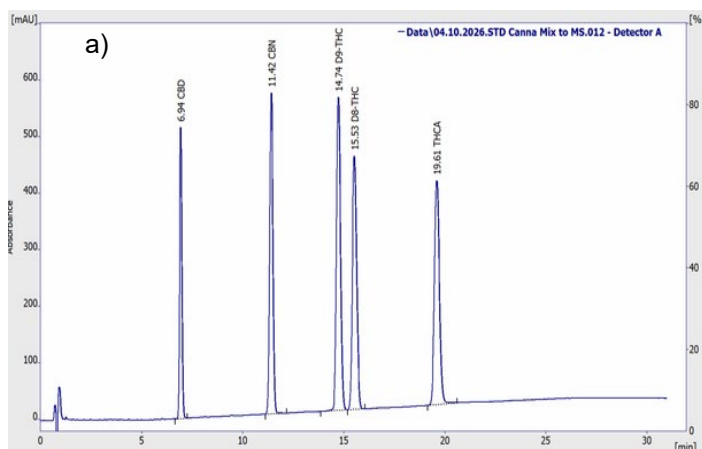
- This application note demonstrates the use of a small footprint LC and ion trap mass spectrometer system
- The approach enables rapid separation, analysis, and identification of cannabinoids within a complex mixture.

INTRODUCTION

Accurate cannabinoid analysis is essential for ensuring product quality, regulatory compliance, and consumer safety within the rapidly expanding cannabis and hemp industries. Detailed molecular characterization of cannabinoids enables differentiation between hemp-derived and cannabis-derived products while supporting potency testing and authentication. Mass spectrometry provides a powerful analytical approach for detecting and profiling cannabinoids with high sensitivity and specificity.

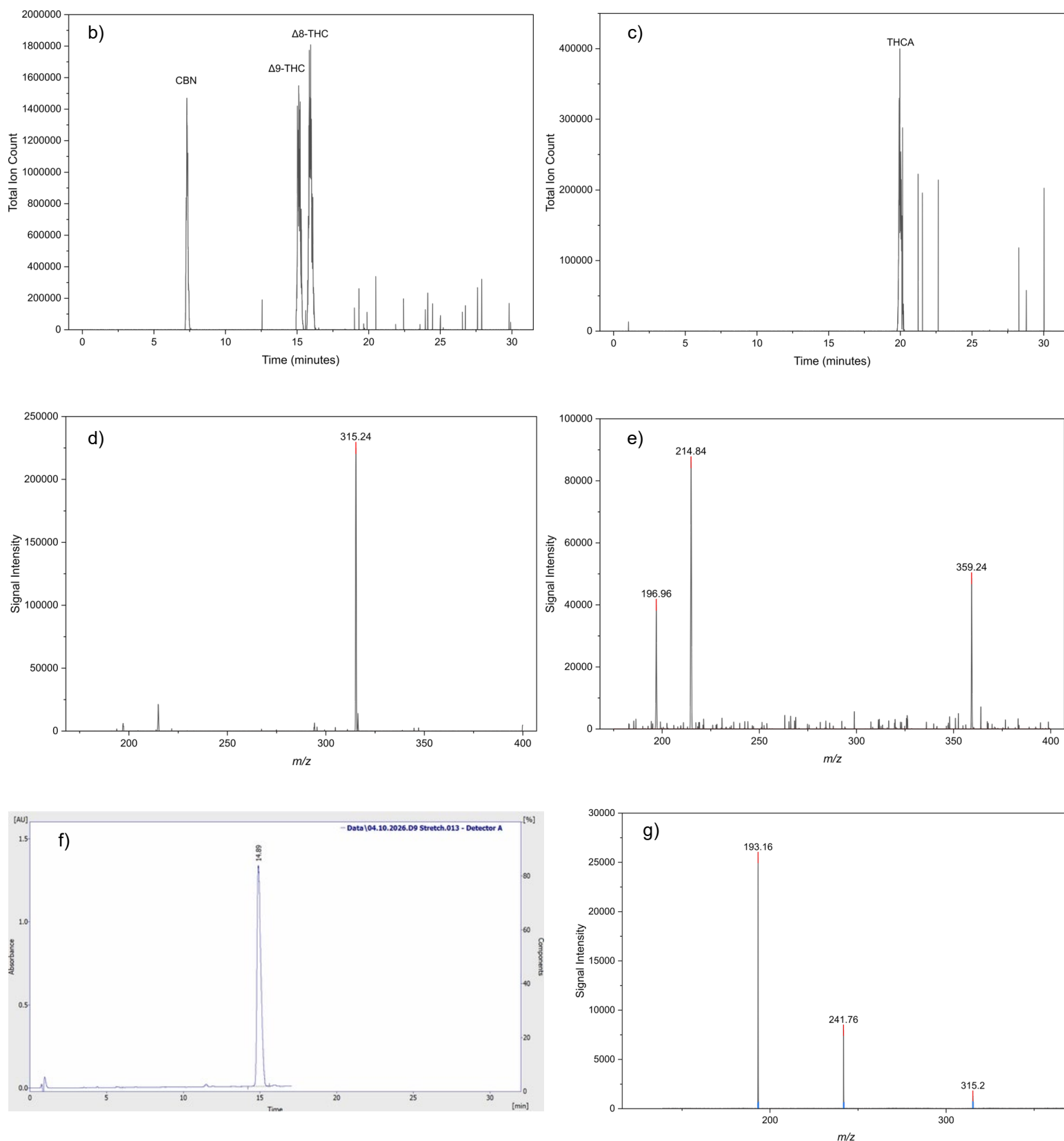
METHODS

- Cannabinoid mixture containing cannabidiol (CBD), cannabinol (CBN), tetrahydrocannabinolic acid (THCA), Δ^8 -tetrahydrocannabinol (Δ^8 -THC), and Δ^9 -tetrahydrocannabinol (Δ^9 -THC) were analyzed with the SmartCanna LC with 280nm LED UV detector (PolyLC) and MT Explorer 30 ion trap mass spectrometer.
- LC separation was performed with Mobile Phases: A: 0.1% formic acid in 65% acetonitrile, and B: 0.1% formic acid in 70% acetonitrile. Flow splitter used to achieve optimal flow rate.
- MS and MS/MS modes employed for component analysis.



LC Separation of 5 Cannabinoids at 280nm





Results

PolyLC Inc.'s SmartCanna LC successfully separated a 5-component cannabinoid mixture, notably achieving baseline resolution of 3 components with the same molecular weight. MS full scan and further MS/MS analysis offer identification and confirmation of cannabinoids.