



# Successful Separation of Delta-8-Carboxy-THC and Delta-9-Carboxy-THC by LC-MS/MS Analysis

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## Overview

Delta-8-Tetrahydrocannabinol (delta-8-THC) is a structural isomer to Delta-9-THC and produces similar mind-altering affects. It is sold as an alternative to marijuana which, while legal in many states, is a DEA Schedule I drug and still illegal under federal law. Legal status of Delta-8-THC is murky and varies by jurisdiction. This has led to an increase in availability and use of Delta-8-THC by drug users looking for a “legal” high. Distinguishing use of Delta-8-THC from Delta-9-THC is important for forensic laboratories conducting drug testing.

Urine is a common specimen used for forensic drugs of abuse testing and workplace drug testing. “Parent” Delta-8-THC and Delta-9-THC are extensively metabolized to their respective carboxy metabolites. The two analytes have similar structures and the same mass (and hence the same m/z), so these two metabolites need to be chromatographically separated for accurate LC-MS/MS identification and quantitation.

This application note provides conditions for separation of the carboxy metabolites of Delta-8-THC and Delta-9-THC using a Synergi 2.5 µm Hydro RP column.

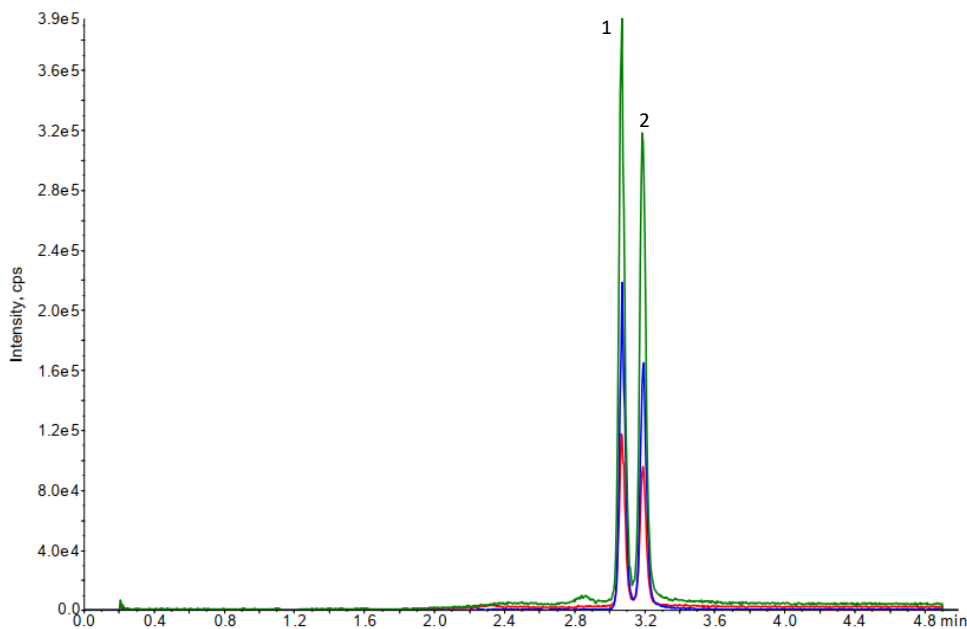
## LC Conditions

- Column:** Synergi™ 2.5 µm Hydro RP
- Dimensions:** 100 x 3.0 mm
- Part No.:** 00D-4387-Y0
- Mobile Phase:** A: 5 mM Ammonium Formate  
B: Methanol
- Gradient:**

Time (min)	%B
0	70
1	95
3.5	95
3.51	70
5	70
- Flow Rate:** 0.4 mL/min
- Injection Volume:** 10 µL
- Temperature:** 25 °C
- LC System:** Agilent® 1260 Infinity
- Detection:** MS/MS
- Detector:** SCIEX® 6500 Triple Quad™
- Analyte Concentrations:** 10 ng/mL

## MS/MS Conditions

- Ion Source:** ESI
- Polarity:** Negative
- Temperature:** 500 °C
- GS1:** 60 psi
- GS2:** 50 psi
- CUR:** 35 psi
- IS:** -3500 V
- CAD:** Medium
- DP:** -40 V
- EP:** -10 V
- CE:** -35 V
- CXP:** -13 V



Peak No.	Analyte	Retention Time (min)	Q1 (m/z)	Q3 (m/z)	Resolution
1	Delta-8-Carboxy-Tetrahydrocannabinol	3.07	343	299.4	2.1
2	Delta-9-Carboxy-Tetrahydrocannabinol	3.2	343	299.4	

Revision: 0  
PHEN-RUO-00199

App ID 27613



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