

Opioids and Tramadol and their metabolites by LC/MS

This application shows the LC/MS method for the most common opiates and their metabolites analyzed by toxicological labs.

Substance

Codeine,

CAS Number 76-57-3

Morphine,

CAS Number 57-27-2

6-O-Acetylmorphine,

6-Monoacetylmorphine,

CAS Number 2784-73-8

Morphine-6-glucuronide,

CAS Number 20290-10-2

Buprenorphine,

CAS Number 52485-79-7

Dihydrocodeine,

CAS Number 125-28-0

Fentanyl,

CAS Number 437-38-7

Acetylfentanyl,

CAS Number 3258-84-2

Naloxone,

CAS Number 465-65-6

Naltrexone,

CAS Number 16590-41-3

Hydromorphone,

CAS Number 466-99-9

Oxymorphone,

CAS Number 76-41-5

Hydrocodone,

CAS Number 125-29-1

Norbuprenorphine,

CAS Number 78715-23-8

Norcodeine,

CAS Number 467-15-2

Norfentanyl,

CAS Number 1609-66-1

Oxycodone,

CAS Number 76-42-6

Meperidine, Pethidine,

CAS Number 57-42-1

Tramadol,

CAS Number 27203-92-5

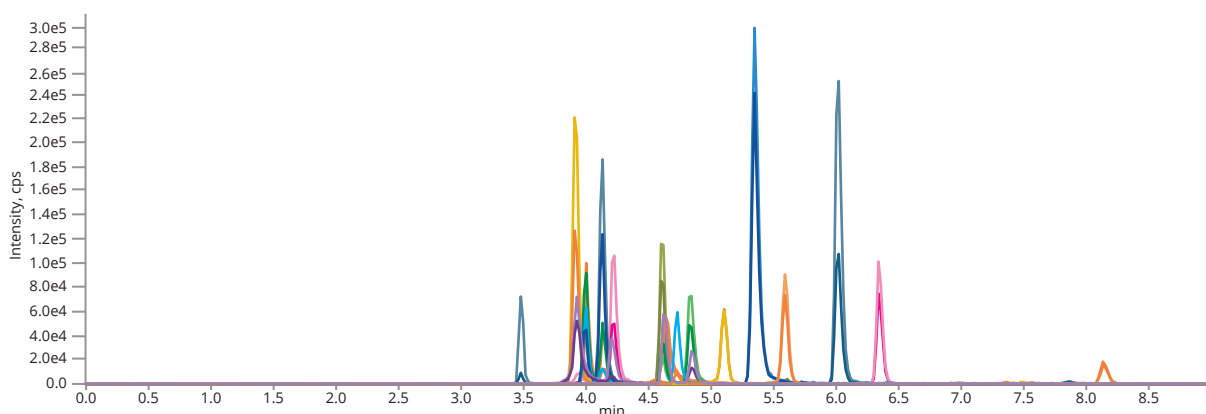
Methadone,

CAS Number 76-99-3

EDDP,

CAS Number 30223-73-5

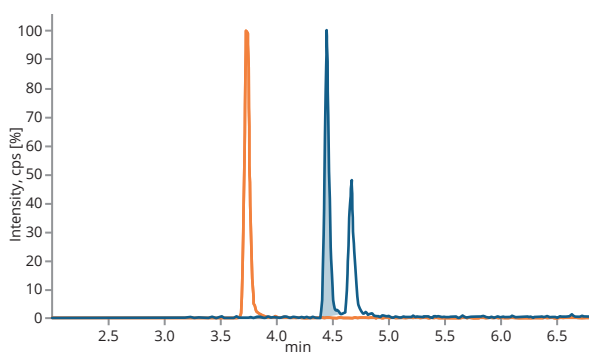
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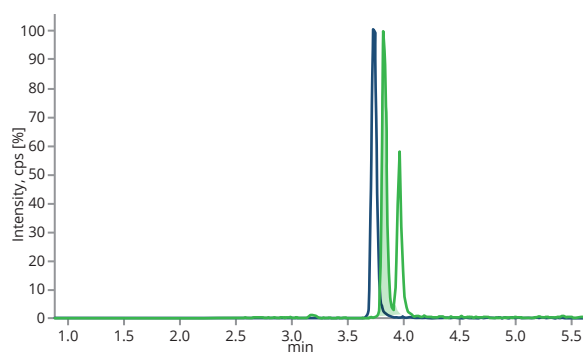
Standard mixture on ARION® column (50 mg/l)

Column	ARION® Plus C18, 3 µm		
Dimensions	50 mm × 3.0 mm		
Part number	ARI-5720-IG30		
Mobile phase	A: 1% ammonium formate in water B: Methanol : 1% ammonium formate in ACN 50/50 (v/v)		
Gradient elution	Time	A (%)	B (%)
	0	100	0
	1	100	0
	6	10	90
	8	10	90
	8.1	100	0
Flow rate	0.5 ml/min		
Temperature	30 °C		
Detection	MS/MS		
Analytes	See MS/MS method		

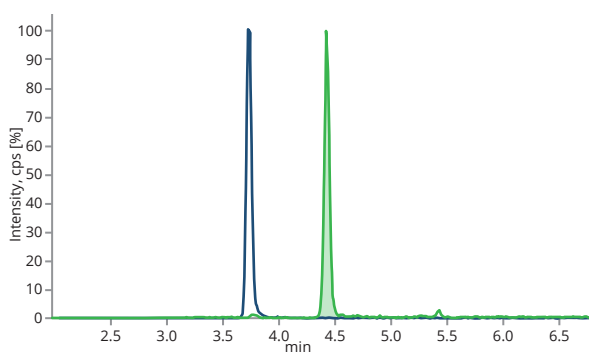
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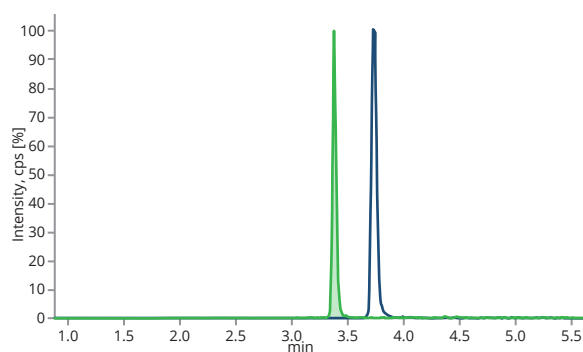
Codeine (300.1->152.0)



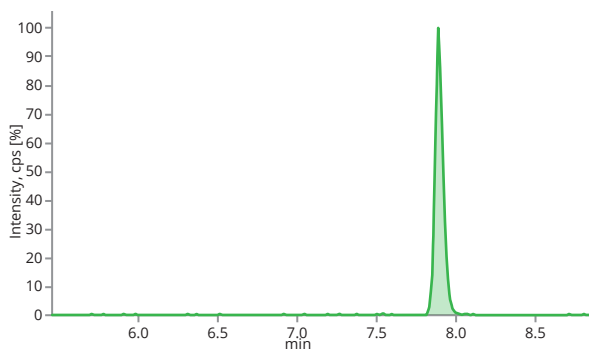
Morphine (286.1 -> 152.0)



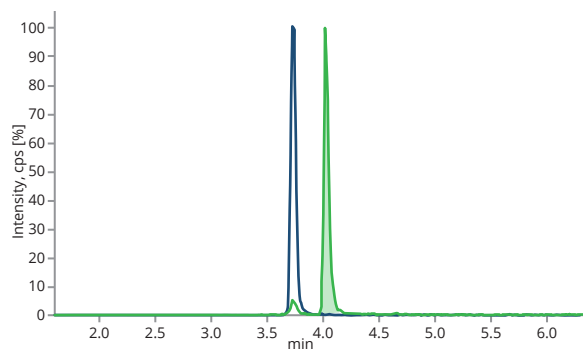
6-O-Acetylmorphine (328.1 -> 165.0)



Morphine-6-glucuronide (462.2 -> 286.2)

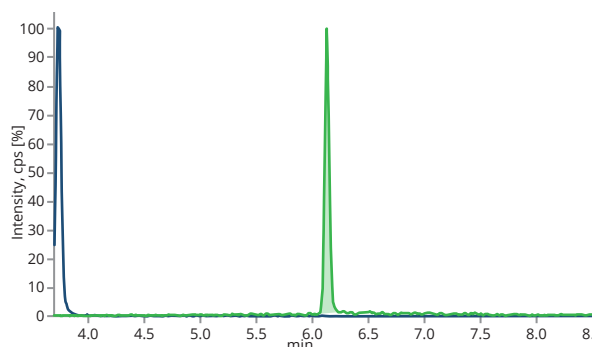


Buprenorphine (468.2 -> 396.0)

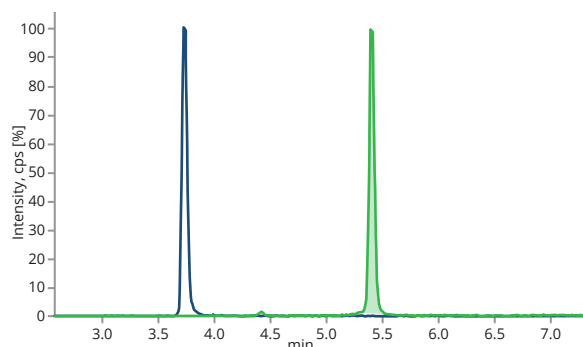


Dihydrocodeine (302.2 -> 199.2)

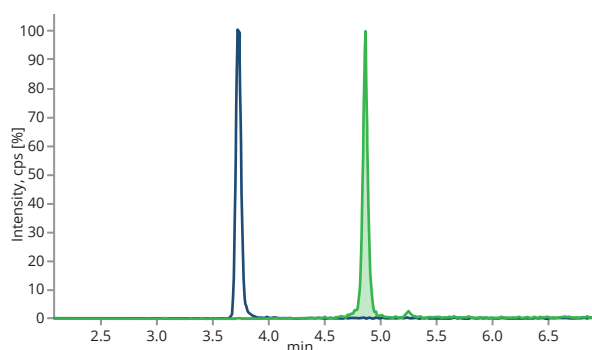
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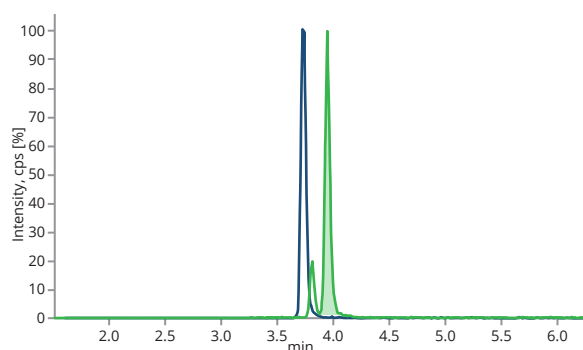
Fentanyl (337.2 → 105.1)



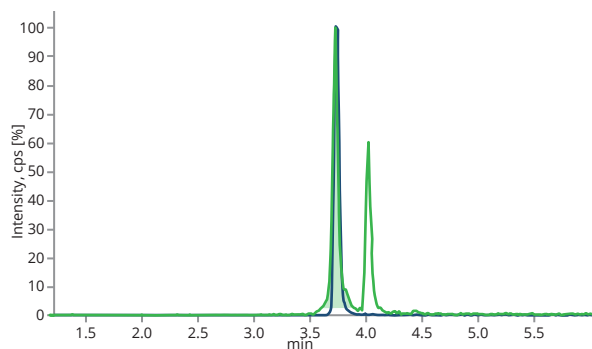
Naloxone (328.1 → 212.1)



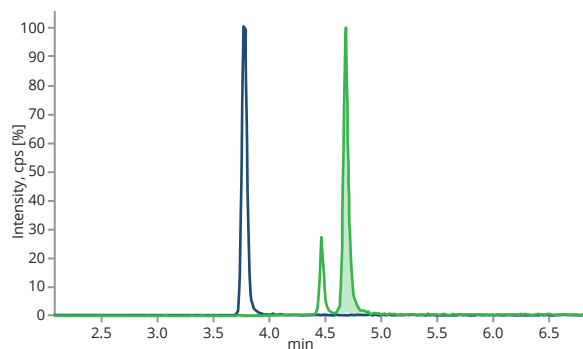
Naltrexone (342.1 → 267.2)



Hydromorphone (286.1 → 185.0)



Oxycodone (302.0 → 227.1)



Hydrocodone (300.1 → 199.0)

Opioids and Tramadol and their metabolites by LC/MS

MS/MS method

Compound name	Precursor Mass	Fragment mass	Type	Collision energy
Codeine	300.1	152.0	Quantifier	35 ± 15 eV
	300.1	165.1	Qualifier	35 ± 15 eV
Morphine	286.1	152.0	Quantifier	35 ± 15 eV
	286.1	165.1	Qualifier	35 ± 15 eV
6-O-Acetylmorphine	328.1	165.0	Quantifier	35 ± 15 eV
	328.1	211.0	Qualifier	35 ± 15 eV
Morphine-6-glucuronide	462.2	286.2	Qualifier	35 ± 15 eV
	462.2	201.1	Qualifier	35 ± 15 eV
Buprenorphine	468.2	396.0	Quantifier	35 ± 15 eV
	468.2	414.0	Qualifier	35 ± 15 eV
Dihydrocodeine	302.2	199.2	Quantifier	35 ± 15 eV
	302.2	171.2	Qualifier	35 ± 15 eV
Fentanyl	337.2	105.1	Quantifier	35 ± 15 eV
	337.2	188.2	Qualifier	35 ± 15 eV
Acetylfentanyl*	323.1	188.1	Quantifier	35 ± 15 eV
	323.1	105.1	Qualifier	35 ± 15 eV
Naloxone	328.1	212.1	Quantifier	35 ± 15 eV
	328.1	253.1	Qualifier	35 ± 15 eV
Naltrexone	342.1	267.2	Quantifier	35 ± 15 eV
	342.1	282.1	Qualifier	35 ± 15 eV
Hydromorphone	286.1	185.0	Quantifier	35 ± 15 eV
	286.1	157.0	Qualifier	35 ± 15 eV
Oxymorphone	302.0	227.1	Quantifier	35 ± 15 eV
	302.0	198.1	Qualifier	35 ± 15 eV

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MS/MS method

Compound name	Precursor Mass	Fragment mass	Type	Collision energy
Hydrocodone	300.1	199.0	Quantifier	35 ± 15 eV
	300.1	128.0	Qualifier	35 ± 15 eV
Norbuprenorphine*	414.3	55.0	Quantifier	35 ± 15 eV
	414.3	83.0	Qualifier	35 ± 15 eV
Norcodeine	286.1	152.0	Quantifier	35 ± 15 eV
	286.1	165.0	Qualifier	35 ± 15 eV
Norfentanyl*	233.1	84.1	Quantifier	35 ± 15 eV
	233.1	150.1	Qualifier	35 ± 15 eV
Oxycodone	316.1	241.1	Quantifier	35 ± 15 eV
	316.1	256.1	Qualifier	35 ± 15 eV
Meperidine (Pethidine)	248.1	220.1	Quantifier	35 ± 15 eV
	248.1	174.0	Qualifier	35 ± 15 eV
Tramadol	264.1	58.1	Quantifier	35 ± 15 eV
	264.1	42.2	Qualifier	35 ± 15 eV
Methadone	310.1	265.0	Quantifier	35 ± 15 eV
	310.1	105.0	Qualifier	35 ± 15 eV
EDDP*	278.1	234.1	Quantifier	35 ± 15 eV
	278.1	186.1	Qualifier	35 ± 15 eV

* Not shown in chromatogram. Note: Internal standard: Morphine D6