Waters™

應用手冊

ACQUITY UPLC I-Class/Xevo TQD IVD System: Analytical Performance for Catecholamines and Metanephrines

Waters Corporation

這是一篇應用簡報，不含詳細的實驗內容章節。

用於體外診斷用途。並非在所有國家/地區均可使用。

Abstract

The Waters ACQUITY™ UPLC™ I-Class/Xevo™ TQD IVD System enables the quantification of organic compounds in human biological liquid matrices.

Introduction

The Waters ACQUITY UPLC I-Class/Xevo TQD IVD System enables the quantification of organic compounds in human biological liquid matrices.

This document describes a test of the analytical performance of the ACQUITY UPLC I-Class/Xevo TQD IVD System for the analysis of norepinephrine, epinephrine, dopamine, normetanephrine, metanephrine, and 3-methoxytyramine in urine.

ACQUITY UPLCI-Class/Xevo TQD IVD System.

Experimental

The ACQUITY UPLC I-Class/Xevo TQD IVD System was controlled by MassLynx™ IVD Software (v4.1) and the data processed using the TargetLynx™ Application Manager. Calibrators and Quality Controls were prepared by spiking commercially available reference material in urine and the samples were processed using the following conditions.

Sample Preparation Conditions

400 µL acidified urine was diluted with 1 mL of 0.5 M ammonium acetate buffer. Samples were loaded onto Oasis™ WCX 30 mg plates, washed, and eluted prior to analysis.

LC Conditions

Column:	ACQUITY UPLC BEH Amide 1.7 µm, 2.1 mm x 100 mm

Mobile phase A:	95:5 Water:acetonitrile containing 50 mM NH_4HCOO, pH 3.0
Mobile phase B:	15:85 Water:acetonitrile containing 30 mM NH_4HCOO, pH 3.0
Flow rate:	0.6 mL/min
Gradient:	100% B over 1 minute, 100–90% B from 1–2 minutes, 90% B at 1.0 mL/min at 2.1 minutes, 90–70% B from 2.1–2.5 minutes

MS Conditions

Resolution:	MS1 (0.75 FWHM), MS2 (0.75 FWHM)
Acquisition mode:	MRM
Polarity:	ESI (+)

Results and Discussion

Performance characteristics of catecholamines and metanephrines on the ACQUITY UPLC I-Class/Xevo TQD IVD System are shown in Table 1. Analytical selectivity of the chromatographic separation is illustrated in Figure 1.

Compound	Range (ng/mL)	LLOQ (ng/mL)	%RSD at LLOQ	Max imprecision	Max bias
3-methoxytyramine	21.7–521.2	21.7	3.1%	5.0%	9.8%
Metanephrine	11.2–510.7	10.7	1.8%	2.9%	4.0%
Normetanephrine	18.3–517.8	17.8	1.1%	4.2%	3.4%
Epinephrine	0.5–500	0.5	8.6%	6.2%	-4.6%
Dopamine	6.5–506	6.0	4.2%	11%	-7.9%
Norepinephrine	5.1–504.6	4.6	16.3%	14.8%	-6.0%

Table 1. Performance characteristics of the analytes evaluated. Range defined by linear fit where r^2 > 0.99. LLOQ defined by S/N (PtP) > 10 and %RSD ≤ 20%. %RSD at LLOQ determined through analytical sensitivity experiments (n=5). Maximum imprecision and bias determined over four concentrations (N=4).

Note: To convert conventional mass units to SI units multiply by 5.98 for 3-MT, 5.07 for MTN, 5.46 for NMT and EP, 6.53 for DA, and 5.91 for NE. All conversions are from ng/mL to nmol/L.

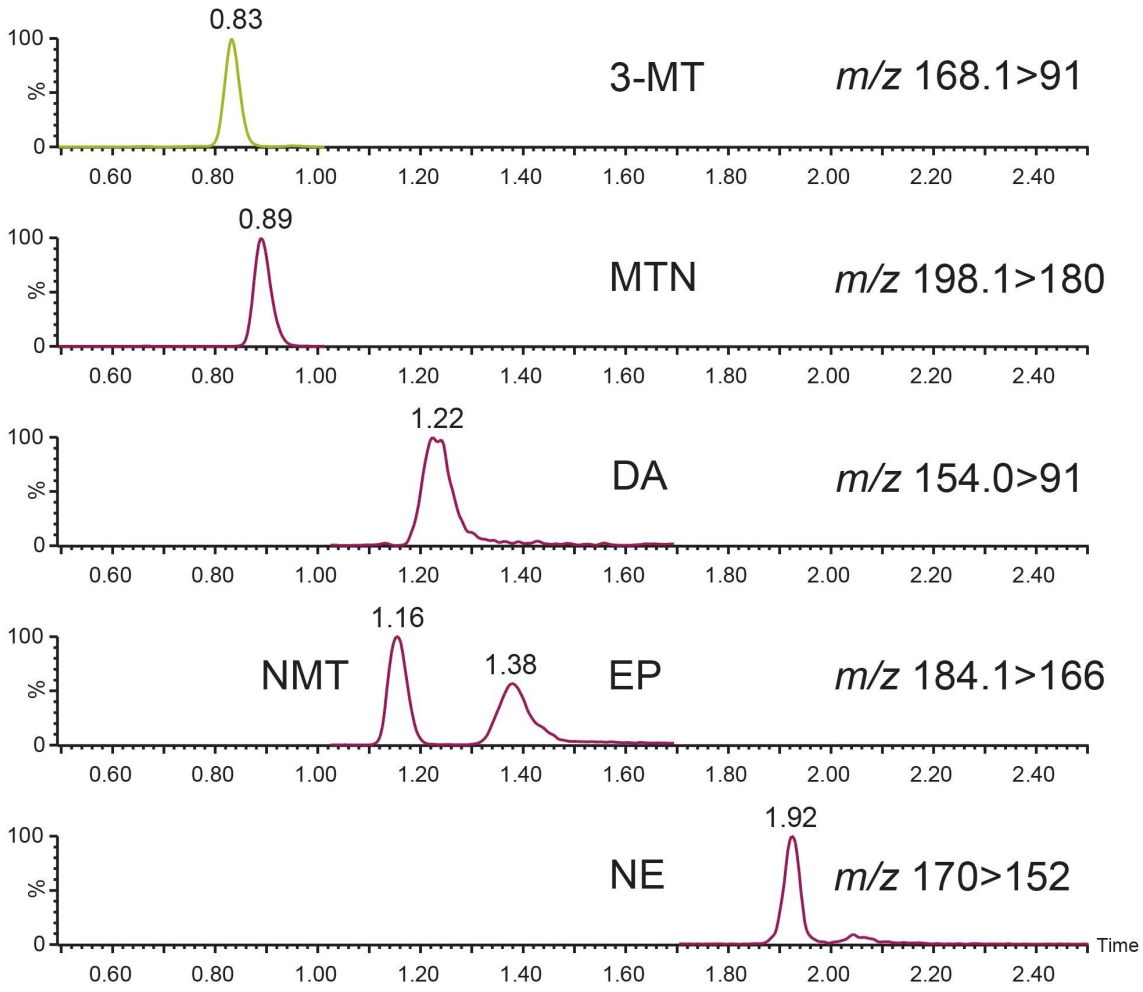

Figure 1. Chromatographic selectivity of catecholamines and metanephrines using the ACQUITY UPLC I-Class/Xevo TQD IVD System.

Note: 3-MT – 3-methoxytyramine; MTN – metanephrine; DA – dopamine; NMT – normetanephrine; EP – epinephrine; NE – norepinephrine.

Conclusion

The Waters™ ACQUITY UPLC I-Class/Xevo TQD IVD System has demonstrated the capability to deliver analytically sensitive and precise chromatography for the analysis of 3-methoxytyramine, metanephrine,

normetanephrine, dopamine, epinephrine, and norepinephrine in urine.

Disclaimer

The analytical performance data presented here is for illustrative purposes only. Waters does not recommend or suggest analysis of the analytes described herein. These data are intended solely to demonstrate the performance capabilities of the system for analytes representative of those commonly analyzed using liquid chromatography and tandem mass spectrometry. Performance in an individual laboratory may differ due to a number of factors, including laboratory methods, materials used, intra-operator technique, and system conditions. This document does not constitute a warranty of merchantability or fitness for any particular purpose, express or implied, including for the testing of the analytes in this analysis.

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MassLynx MS Software <https://www.waters.com/513662>

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