

MACHEREY-NAGEL

NUCLEOSHELL[®] Bluebird RP 18

Cromatografía



Análisis rápidos en condiciones altamente acuosas

- Fase especial de tipo core-shell con octadecilo y terminación hidrófila
- Adecuado para LC/MS gracias a sus bajas propiedades de filtrado
- Extremadamente resistente en fase móvil 100 % acuosa

MACHEREY-NAGEL

www.mn-net.com



Características principales

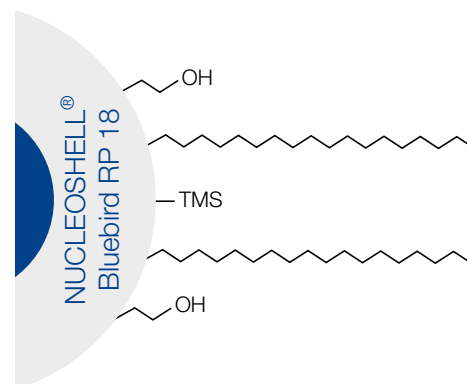
- Fase especial de tipo core-shell con octadecilo y terminación hidrófila
- Selectividad polar clara
- Extremadamente resistente en fase móvil 100 % acuosa
- Excelente desactivación de bases
- Adecuado para LC/MS gracias a sus bajas propiedades de filtrado

Aplicaciones recomendadas

- Vitaminas hidrosolubles
- Ácidos orgánicos
- Nitrosaminas
- Plaguicidas
- Edulcorantes
- Productos farmacéuticos
- Analitos muy polares

USP L1

Fases similares: Kinetex® Polar C18



Datos técnicos

Modificación con octadecilo y terminación polar en partículas núcleo-corteza

Estabilidad del pH:	1-8
Tamaño de partículas:	2,7 µm (núcleo de 1,7 µm)
Tamaño de poro:	90 Å
Superficie específica:	130 m ² /g
Contenido de carbono:	5 %

Batch-to-batch reproducibility

MN Appl. No. 128610

Chromatographic conditions

Column:	EC 50/4 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
MN REF:	763432.40
Eluent:	25 mM ammonium dihydrogen phosphate solution – methanol (35:65, v/v), pH = 7.0
Flow rate:	1.0 mL/min
Temperature:	40 °C
Detection:	UV, 254 nm
Injection:	5 µL

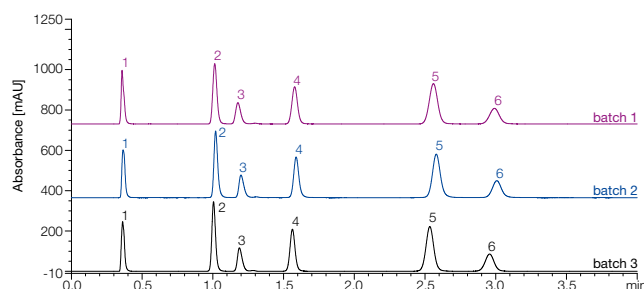
Concentration

Uracil	45 µg/mL
Ethyl benzoate	181 µg/mL
Lidocaine	1134 µg/mL
Naphthalene	1134 µg/mL
Biphenyl	45 µg/mL
Acenaphthene	227 µg/mL

The mixture was diluted to 4 mL with water

Analyte	Peak No.
Uracil	1
Ethyl benzoate	2
Lidocaine	3
Naphthalene	4
Biphenyl	5
Acenaphthene	6

Chromatograms




Excelente reproducibilidad

La elevada reproducibilidad interlotes de las columnas NUCLEOSHELL® Bluebird RP 18 garantiza resultados fiables para diferentes lotes.

Organic acids

MN Appl. No. 128330

Chromatographic conditions

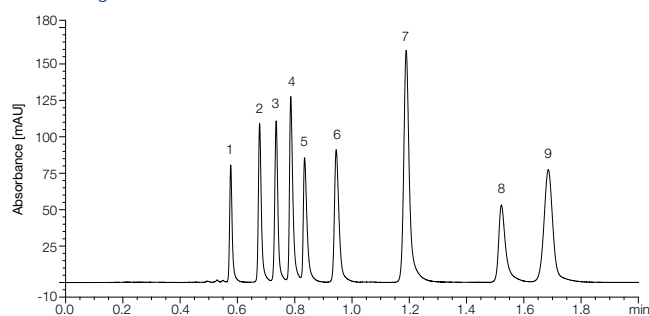
	Column:	EC 150/4 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
	MN REF:	763436.40
	Eluent:	50 mM potassium dihydrogen phosphate solution, pH = 2.5
	Flow rate:	2.0 mL/min
	Temperature:	40 °C
	Detection:	UV, 210 nm
	Injection:	3 µL

Concentration (in water)

Tartaric acid	135 µg/mL
Malic acid	2162 µg/mL
Shikimic acid	27 µg/mL
Lactic acid	2703 µg/mL
Acetic acid	2703 µg/mL
Citric acid	1081 µg/mL
Fumaric acid	41 µg/mL
Acrylic acid	676 µg/mL
Arbutin	216 µg/mL

Analyte	Peak No.
Tartaric acid	1
Malic acid	2
Shikimic acid	3
Lactic acid	4
Acetic acid	5
Citric acid	6
Fumaric acid	7
Acrylic acid	8
Arbutin	9

Chromatogram



Mayor estabilidad


Excelente rendimiento con una fase móvil 100 % acuosa.



Polar and non polar substances

MN Appl. No. 128590

Chromatographic conditions

	Column:	EC 100/2 NUCLEOSHELL® Bluebird RP 18, 2.7 µm 100/2.1 Kinetex® 2.6 µm Polar C18, 100 Å
	MN REF:	763434.20
	Eluent:	25 mM ammonium dihydrogen phosphate solution – methanol (35:65, v/v), pH = 7.0
	Flow rate:	0.66 mL/min
	Temperature:	40 °C
	Detection:	UV, 254 nm
	Injection:	5 µL

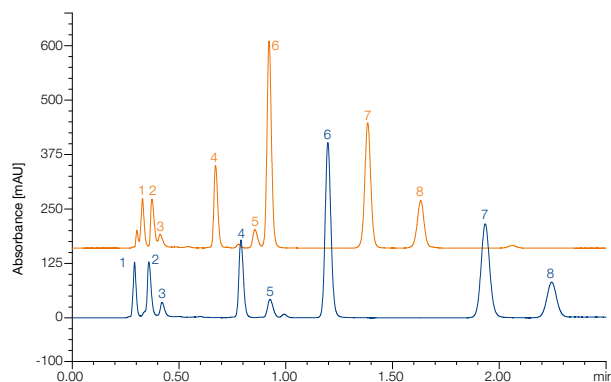
Concentration (in water)

Uracil	45 µg/mL
2,7-DHN	45 µg/mL
2,3-DHN	45 µg/mL
Ethyl benzoate	180 µg/mL
Lidocaine	1123 µg/mL
Naphthalene	1123 µg/mL
Biphenyl	45 µg/mL
Acenaphthene	225 µg/mL

DHN = Dihydroxynaphthalene

Analyte	Peak No.
Uracil	1
2,7-Dihydroxynaphthalene	2
2,3-Dihydroxynaphthalene	3
Ethyl benzoate	4
Lidocaine	5
Naphthalene	6
Biphenyl	7
Acenaphthene	8

Chromatograms



Superior a Kinetex® Polar C18


NUCLEOSHELL® Bluebird RP 18 muestra una separación completa de lidocaína y naftaleno, además de unas formas de pico más definidas para todos los analitos frente a Kinetex® Polar C18.



Pesticides

MN Appl. No. 128620

Chromatographic conditions

 Column: EC 50/4.6 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
 MN REF: 763432.46
 Eluent A: 0.1 % formic acid in water
 Eluent B: 0.1 % formic acid in methanol
 Gradient: in 5 min from 5 % to 100 % B, hold for 1.0 min,
 in 0.1 min to 5 % B, hold 5 % B for 3.9 min
 Flow rate: 0.7 mL/min
 Temperature: 30 °C
 Detection: MS, SMRM
 Injection: 20 µL

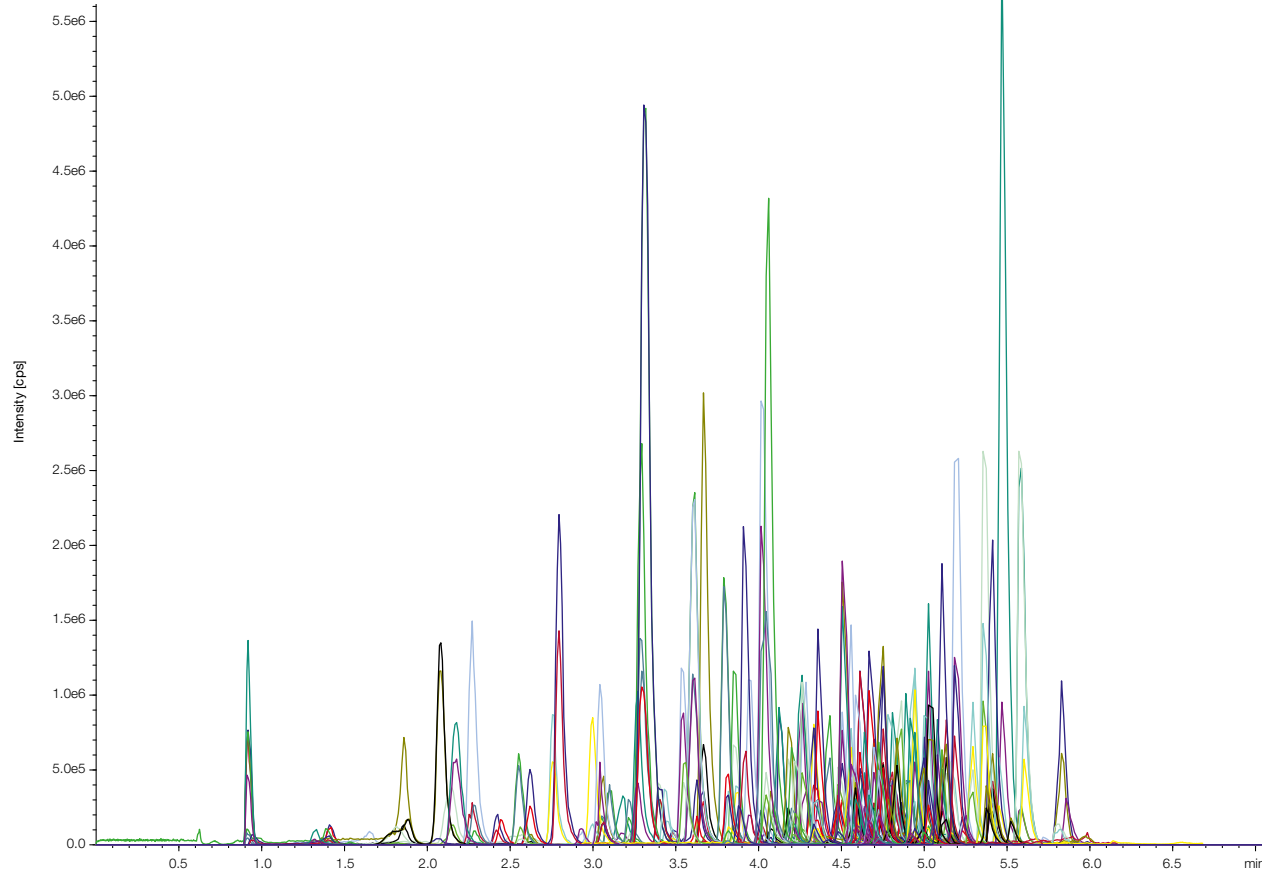
Concentration

2 ng/mL for each analyte in water – acetonitrile (4:1, v/v)

Sample pretreatment according to MN Appl. No. 306590

- Dispersive solid phase extraction (EN 15662)
- QuEChERS Mix I (MN REF 730970) and QuEChERS Mix III (MN REF 730972)
- Sample matrix: red grape

Chromatogram



Retention times

Analyte	RT [min]
Cyromazine	0.95
Propamocarb	1.30
Formetanate HCl	1.36
Aminocarb	1.40
Methamidophos	1.43
Pymetrozine	1.52
Acephate	1.69
Carbendazim	1.84
Nitenpyram	1.84

Analyte	RT [min]
Omethoate	1.93
Dinotefuran	2.09
Mexacarbate	2.13
Thiabendazole	2.19
Aldicarb sulfone	2.20
Fuberidazole	2.29
Oxamyl	2.32
Flonicamid	2.41
Methomyl	2.44

Continued on page 5

Continued from page 4

Analyte	RT [min]
Thiamethoxam	2.56
Ethirimol	2.60
Monocrotophos	2.67
Dicrotophos	2.80
Pirimicarb	2.88
Imidacloprid	2.94
Clothianidin	2.96
Fenuron	3.03
Vamidothion	3.09
3-Hydroxycarbofuran	3.10
Dioxacarb	3.10
Dimethoate	3.17
Acetamiprid	3.18
Imazalil	3.22
Cymoxanil	3.28
Simetryn	3.29
Prometon	3.37
Secbumeton	3.37
Terbumeton	3.39
Thiacloprid	3.43
Mevinphos (Mix of isomers)	3.46
Butocarboxim	3.51
Spiroxamine (Mix of isomers)	3.52
Aldicarb	3.55
Fenpropimorph	3.55
Tricyclazole	3.55
Oxadixyl	3.60
Carbetamide	3.71
Mesotrione	3.71
Ametryn	3.80
Methoprotryne	3.80
Propoxur	3.84
Metribuzin	3.85
Bendiocarb	3.89
Carbofuran	3.89
Thidiazuron	3.92
Tebuthiuron	3.94
Pyracarbolid	3.98
Prometryn	4.03
Terbutryn	4.04
Carbaryl	4.05
Carboxin	4.05
Monolinuron	4.10
Ethiofencarb	4.13
Fluometuron	4.17
Pyrimethanil	4.19

Analyte	RT [min]
Chlorotoluron	4.20
Flutriafol	4.20
Spinosad (Spinosyn A)	4.20
Isoprocarb	4.24
Propham	4.24
Butoxycarboxim	4.28
Methabenzthiazuron	4.28
Metalaxyl	4.29
Isoproturon	4.31
Spinosad (Spinosyn D)	4.32
Isocarbophos	4.33
Spinetoram	4.33
Cycluron	4.34
Hydramethylnon	4.34
Forchlorfenuron	4.35
Chlorantraniliprole	4.41
Bupirimate	4.43
Diethofencarb	4.47
Emamectin B1a benzoate	4.48
Ethiprole	4.48
Metobromuron	4.50
Fenobucarb	4.51
Fenhexamid	4.52
Furalaxyl	4.52
Ethofumesate	4.53
Halofenozide	4.56
Azoxystrobin	4.57
Fenamidone	4.57
Linuron	4.58
Methiocarb	4.59
Carfentrazone-ethyl	4.60
Diuron	4.60
Paclobutrazol	4.60
Siduron	4.60
Promecarb	4.62
Dimethomorph (Mix of isomers)	4.63
Fludioxinil	4.63
Cyprodinil	4.64
Flutolanil	4.64
Myclobutanil	4.64
Triadimenol	4.64
Triadimefon	4.65
Acibenzolar-S-methyl	4.69
Cyproconazole (Mix of isomers)	4.69
Bifenazate	4.70
Bromuconazole (Mix of isomers)	4.70

Continued on page 6

Continued from page 5

Analyte	RT [min]
Clethodim (Mix of isomers)	4.70
Mepronil	4.70
Triticonazole	4.72
Methoxyfenozide	4.73
Chloroxuron	4.74
Mefenacet	4.74
Tetraconazole	4.74
Butafenacil	4.75
Flufenacet	4.76
Spirotetramat	4.76
Iprovalicarb (Mix of isomers)	4.77
Etaconazole (Mix of isomers)	4.78
Fipronil	4.78
Fluoxastrobin	4.80
Epoxiconazole	4.82
Fenbuconazole	4.82
Flusilazole	4.84
Mepanipirim	4.84
Cyazofamid	4.85
Diflubenzuron	4.85
Prochloraz	4.87
Fenoxycarb	4.91
Neburon	4.93
Dimoxystrobin	4.94
Penconazole	4.94
Rotenone	4.95
Tebuconazole	4.95
Picoxystrobin	4.97
Flubendiamide	4.98
Propiconazole (Mix of isomers)	4.99
Hexaconazole	5.00
Metconazole	5.00
Amitraz	5.01
Benalaxyl	5.03
Triflumizole	5.03
Triflumuron	5.05
Diniconazole	5.09
(Monceren) Pencycuron	5.10
Diclobutrazol	5.10
Etaconazole (Mix of isomers)	5.10
Pyraclostrobin	5.10
Indoxacarb	5.13
Thiobencarb	5.13
Benzoximate	5.16
Clofentezine	5.16
Buprofezin	5.17

Analyte	RT [min]
Ipconazole (Mix of isomers)	5.17
Trifloxystrobin	5.20
Clethodim (Mix of isomers)	5.23
Metaflumizone	5.26
Tebufenpyrad	5.29
Furathiocarb	5.30
Tebufenozide	5.36
Piperonyl butoxide	5.38
Temephos	5.39
Flufenoxuron	5.41
Hexythiazox	5.41
Fenazaquin	5.42
Pyriproxyfen	5.42
Quinoxifen	5.42
Propargite	5.45
Etoxazole	5.46
Spirodiclofen	5.52
Eprinomectin	5.54
Avermectin B1a	5.57
Fenpyroximate	5.58
Mandipropamid	5.58
Pyridaben	5.60
Doramectin	5.66
Nuarimol	5.66
Moxidectin	5.71
Ivermectin	5.74
Difenoconazole (Mix of isomers)	5.80
Trichlorfon	6.18

Chromatogram on page 4

Análisis rápidos


Análisis LC/MS de más de 190 plaguicidas en menos de 6 minutos en NUCLEOSHELL® Bluebird RP 18.



Water-soluble vitamins

MN Appl. No. 128550

Chromatographic conditions

	Column:	EC 50/4.6 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
	MN REF:	763432.46
	Eluent A:	10 mM ammonium formate + 0.1 % formic acid in water
	Eluent B:	10 mM ammonium formate + 0.1 % formic acid in methanol
	Gradient:	in 2.5 min from 5 % to 95 %, hold for 0.5 min, back to 5 % B in 0.1 min, hold for 1.9 min
	Flow rate:	1.3 mL/min
	Temperature:	40 °C
	Detection:	MS, SMRM
	Injection:	5 µL

Concentration

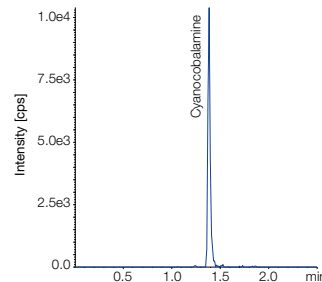
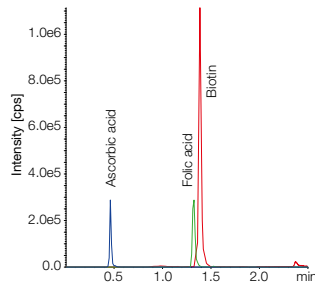
5000 ng/mL for ascorbic acid, 75 ng/mL for all other analytes

MRM transitions

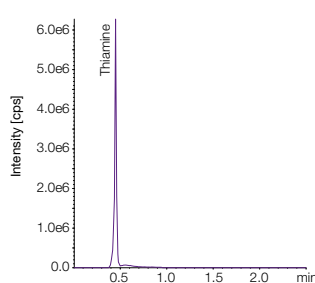
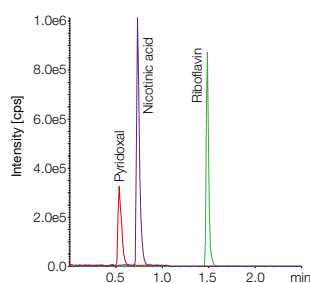
Analyte	RT [min]	[M+H] ⁺	Q ₁ (Quantifier)	Q ₂ (Qualifier)
Thiamine	0.45	265.1	122.1	144.0
Ascorbic acid	0.46	175.1	86.9	115.0
Pyridoxal	0.53	168.0	150.1	94.2
Pyridoxine	0.54	170.1	152.1	134.0
Nicotinic acid	0.58	124.0	80.1	53.1
Nicotinamide	0.73	123.0	80.0	78.0
Pantothenic acid	0.91	220.1	90.1	201.9
Folic acid	1.32	442.2	295.0	425.3
Biotin	1.38	245.1	226.9	97.1
Cyanocobalamin	1.38	678.5	147.2	359.0
Riboflavin	1.48	377.1	242.9	172.0

Chromatograms

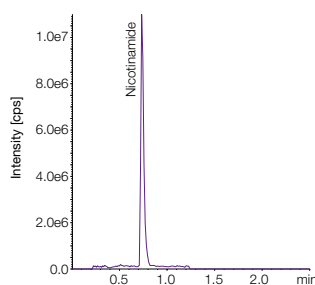
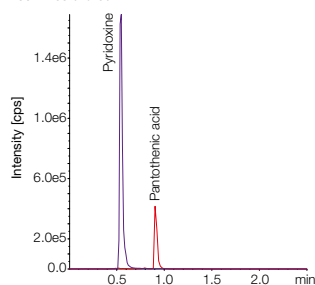
Multivitamin tablet, 100 mg/mL



10 times diluted




100 times diluted



THC and its metabolites

MN Appl. No. 128410

Chromatographic conditions

	Column:	EC 50/4.6 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
	MN REF:	763432.46
	Eluent A:	0.1 % formic acid in water
	Eluent B:	0.1 % formic acid in acetonitrile
	Gradient:	in 2.5 min from 0 % to 90 % B, hold for 0.5 min, in 0.1 min to 0 % B, hold 0 % B for 2.9 min
	Flow rate:	1.3 mL/min
	Temperature:	40 °C
	Detection:	MS, SMRM
	Injection:	5 µL

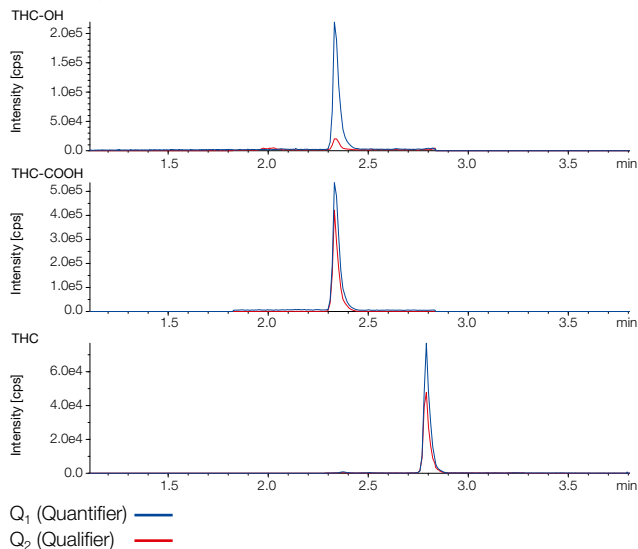
Concentration

50 ng/mL for each analyte

MRM transitions

Analyte	RT [min]	[M+H] ⁺	Q ₁ (Quantifier)	Q ₂ (Qualifier)
THC-OH	2.33	331.2	99.1	43.1
THC-COOH	2.33	345.2	327.2	299.2
THC	2.79	315.2	193.1	123.1


Chromatograms



Sulfa drugs

MN Appl. No. 128390

Chromatographic conditions

	Column:	EC 50/4.6 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
	MN REF:	763432.46
	Eluent A:	0.1 % formic acid in water
	Eluent B:	0.1 % formic acid in methanol
	Gradient:	in 4.0 min from 5 % to 20 % B, in 1.0 min to 80 % B, hold 80 % B for 0.5 min, in 0.1 min to 5 % B, hold 5 % B for 4.4 min
	Flow rate:	1.3 mL/min
	Temperature:	50 °C
	Detection:	MS, MRM
	Injection:	5 µL

Concentration

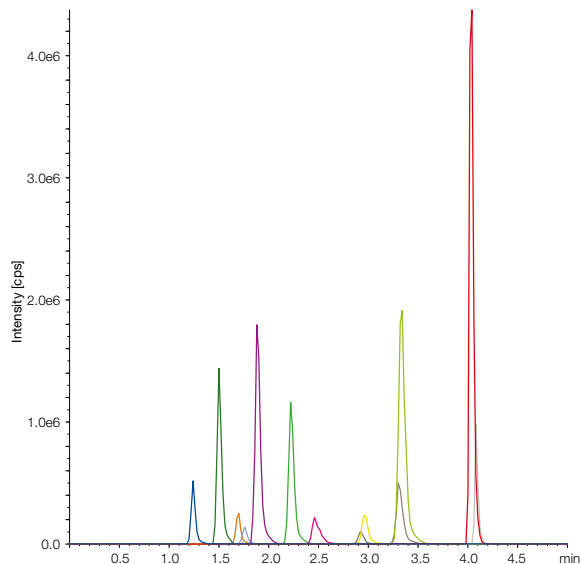
100 ng/mL for each analyte

MRM transitions

Analyte	RT [min]	[M+H] ⁺	Q ₁ (Quantifier)	Q ₂ (Qualifier)
Sulfacetamide	1.24	215.2	156.2	92.1
Sulfadiazine	1.50	251.2	156.1	92.1
Sulfapyridine	1.69	250.2	156.1	92.0
Sulfatiazole	1.75	256.2	156.2	92.1
Sulfamerazine	1.89	265.1	156.1	92.1
Sulfadimidine	2.22	279.2	185.9	65.0
Sulfamethoxypyridazine	2.46	281.2	156.1	92.2
Sulfamonomethoxine	2.92	281.2	156.1	92.2

Analyte	RT [min]	[M+H] ⁺	Q ₁ (Quantifier)	Q ₂ (Qualifier)
Sulfachlorpyridazine	2.96	285.2	156.1	92.1
Sulfamethoxazole	3.31	254.2	156.1	92.1
Sulfadoxine	3.72	311.1	156.1	92.1
Sulfadimethoxine	4.03	311.1	156.1	92.1
Sulfaquinoxaline	4.08	301.2	156.1	92.1

Chromatogram



Sweeteners

MN Appl. No. 128500

Chromatographic conditions

- Column: EC 100/2 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
- MN REF: 763434.20
- Eluent A: 0.1 % formic acid in water
- Eluent B: 0.1 % formic acid in methanol
- Gradient: 5–95 % B in 4.5 min, hold for 1.0 min, back to 5 % B in 0.1 min, hold for 4.4 min
- Flow rate: 0.3 mL/min
- Temperature: 40 °C
- Detection: MS, SMRM
- Injection: 10 µL

Concentration

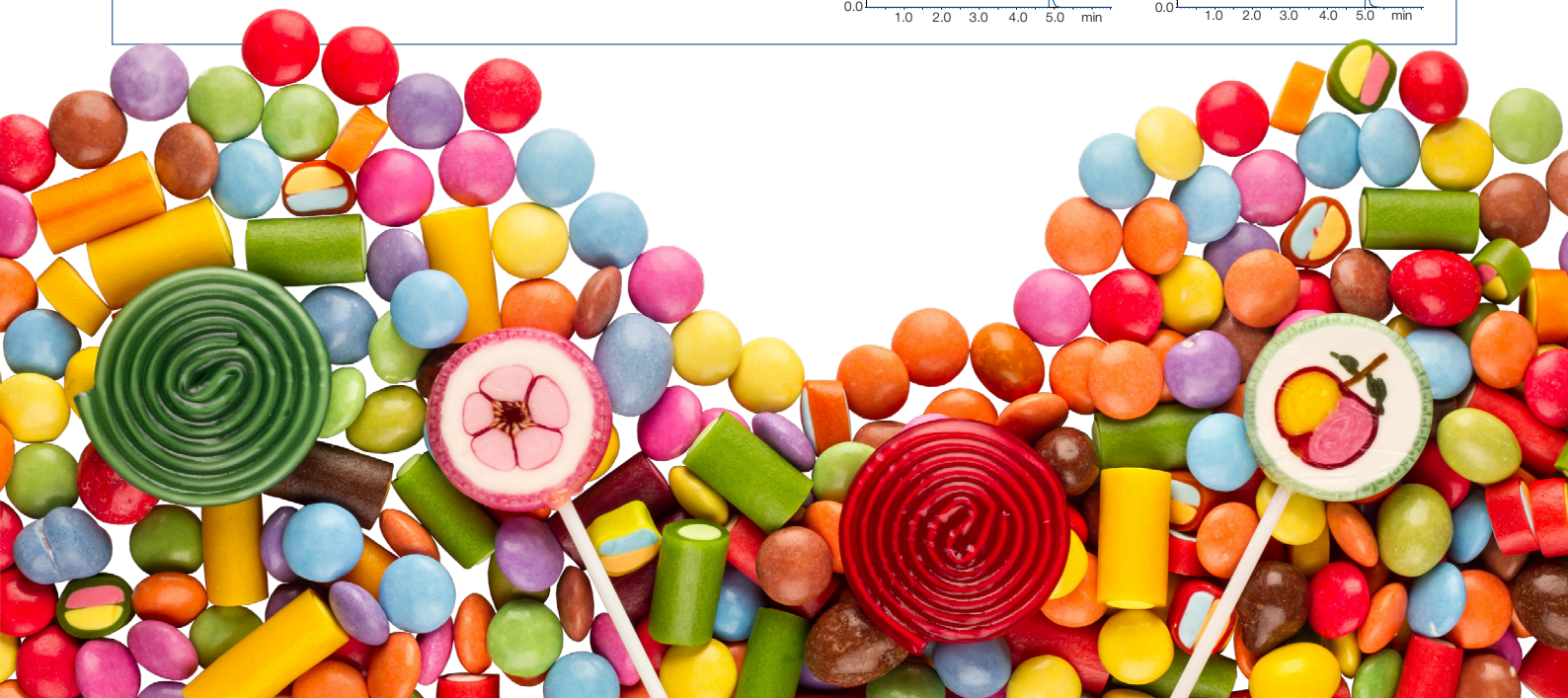
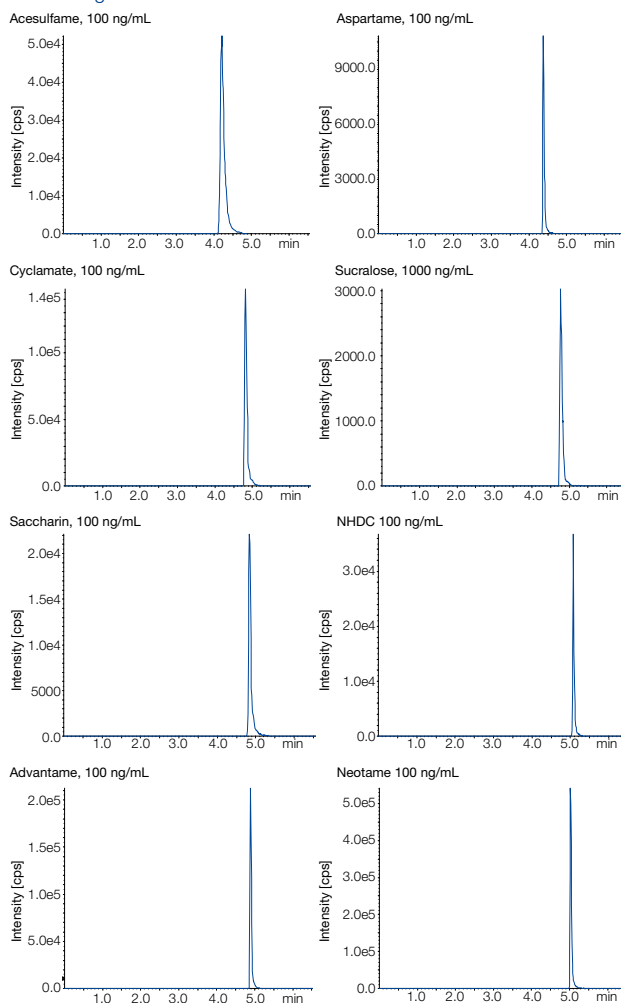
1000 ng/mL for sucralose, 100 ng/mL for all other analytes

MRM transitions

Analyte	Polarity	RT [min]	[M-H] ⁻	Q ₁ (Quantifier)	Q ₂ (Qualifier)
Acesulfame	negative	4.25	161.9	82.0	77.9
Aspartame	negative	4.38	292.9	146.2	261.3
Cyclamate	negative	4.83	177.9	79.8	80.4
Sucralose	negative	4.83	395.1	178.1	80.0
Saccharin	negative	4.85	181.9	42.2	106.0
NHDC	negative	5.07	611.4	303.3	125.0

Analyte	Polarity	RT [min]	[M+H] ⁺	Q ₁ (Quantifier)	Q ₂ (Qualifier)
Advantame	positive	4.98	459.3	102.1	84.1
Neotame	positive	5.12	379.3	172.3	85.2


Chromatograms



Radiocontrast agents

MN Appl. No. 128570

Chromatographic conditions


Column: EC 100/2 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
MN REF: 763434.20
Eluent A: 5 mmol/L ammonium formate + 0.5 % formic acid + 1.0 % acetonitrile in water
Eluent B: acetonitrile
Gradient: hold 5 % B for 10.0 min, in 4 min from 5 % to 80 % B, hold for 1.0 min, in 0.1 min to 5 % B, hold 5 % B for 4.9 min
Flow rate: 0.4 mL/min
Temperature: 30 °C
Detection: MS, MRM
Injection: 20 µL

MRM transitions

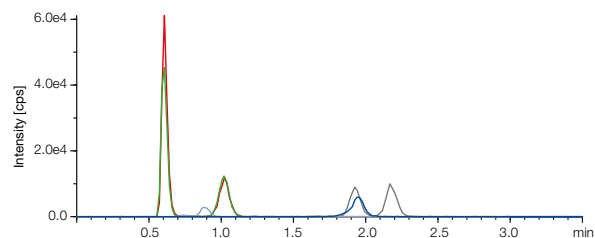
Analyte	RT [min]	[M+H] ⁺	Q ₁ (Quantifier)	Q ₂ (Qualifier)
lohexol	0.75/0.88	821.7	528.8	656.8
lopromide	1.93/2.17	791.8	572.9	558.9
lopamidol	0.61	777.7	558.9	631.7
lomeprol	1.01	777.7	686.8	558.8
Diatrizoic acid	1.95	614.7	487.7	579.5

Concentration

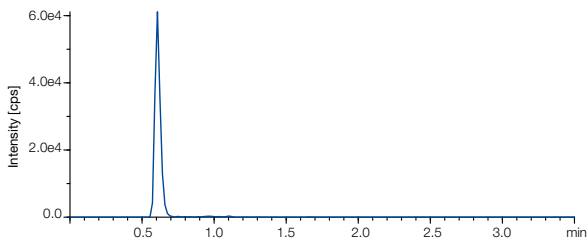
5 ng/mL for each analyte

Chromatograms

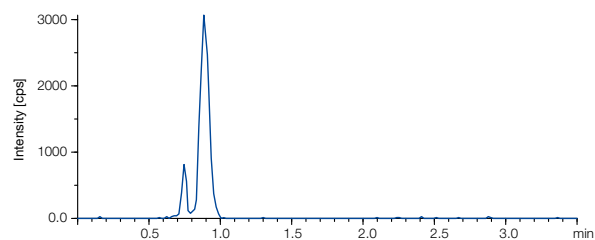
MRM-Overlay



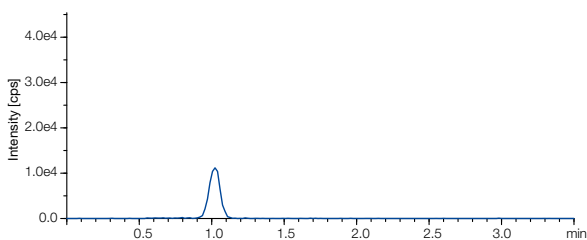
lopamidol



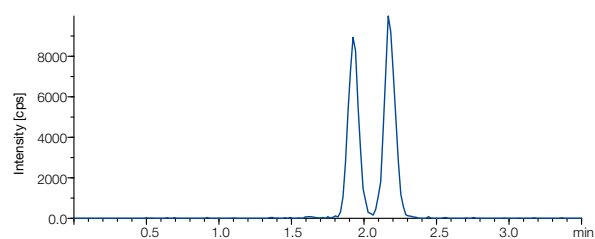
lohexol



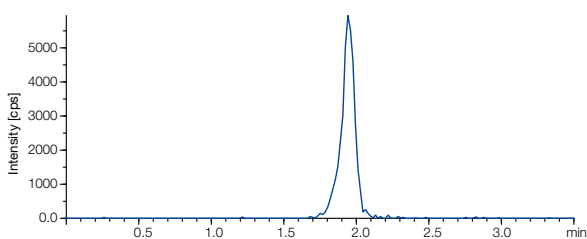
lomeprol



lopromide




Diatrizoic acid



Drug analytes

MN Appl. No. 128340

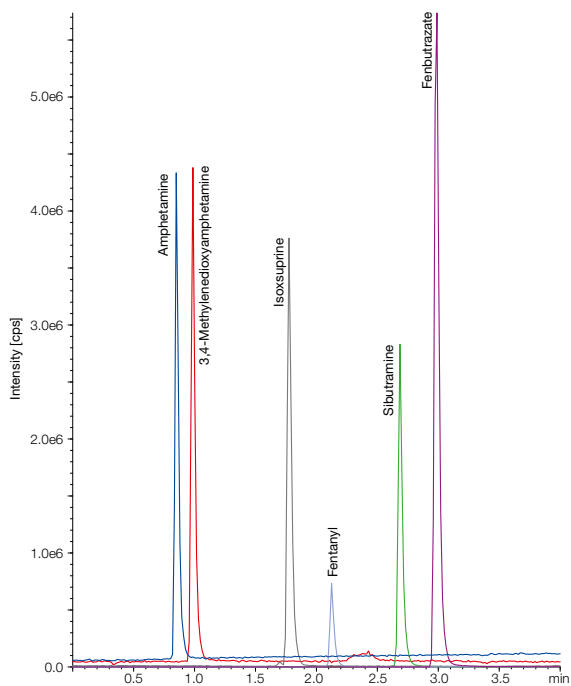
Chromatographic conditions

 Column: EC 50/4.6 NUCLEOSHELL® Bluebird RP 18, 2.7 µm
 MN REF: 763432.46
 Eluent A: 0.1 % formic acid in water
 Eluent B: 0.1 % formic acid in methanol
 Gradient: in 4.5 min from 5 % to 90 % B, hold for 0.5 min, in 0.5 min to 5 % B, hold 0 % B for 4.5 min
 Flow rate: 1.3 mL/min
 Temperature: 30 °C
 Detection: MS, SMRM
 Injection: 5 µL

Concentration

50 ng/mL for each analyte

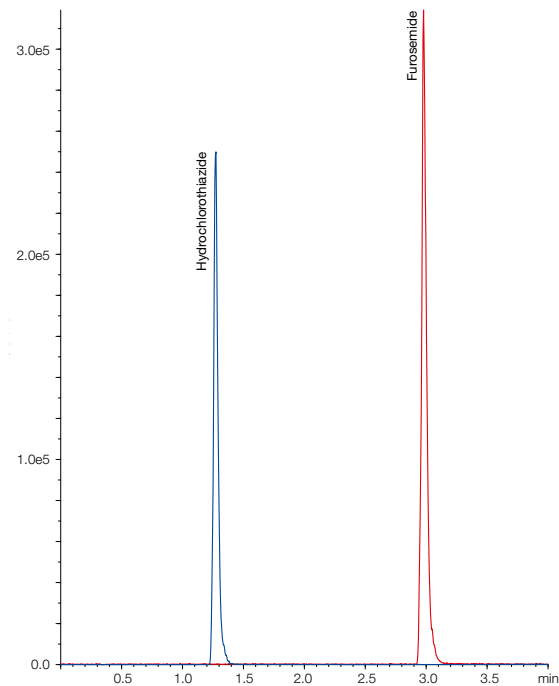
Chromatograms



MRM transitions

Analyte	RT [min]	[M+H] ⁺	Q ₁ (Quantifier)	Q ₂ (Qualifier)
Amphetamine	0.85	136.0	91.1	108.9
3,4-Methylenedioxyamphetamine	0.99	180.0	163.1	105.0
Isoxsuprine	1.78	303.0	285.1	77.1
Fentanyl	2.13	337.0	304.9	105.1
Sibutramine	2.69	280.0	125.0	139.1
Fenbutrazate	2.99	368.2	191.1	91.1

Analyte	RT [min]	[M-H] ⁻	Q ₁ (Quantifier)	Q ₂ (Qualifier)
Hydrochlorothiazide	1.27	295.9	268.7	98.9
Furosemide	2.98	329.0	283.2	255.2



NUCLEOSHELL® Bluebird RP 18

Información de pedido

Longitud	50 mm	75 mm	100 mm	125 mm	150 mm
NUCLEOSHELL® Bluebird RP 18, 2,7 µm					
Columnas EC (envase de 1)					
DI 2 mm	763432.20	763433.20	763434.20	763435.20	763436.20
DI 3 mm	763432.30	763433.30	763434.30	763435.30	763436.30
DI 4 mm	763432.40	763433.40	763434.40	763435.40	763436.40
DI 4,6 mm	763432.46	763433.46	763434.46	763435.46	763436.46



Selección de columnas de protección

Para columna EC con DI de		REF columna de protección	Soporte de columna de protección obligatorio (sistema de protección de columnas)
2 mm	EC 4/2 (envase de 3)	763438.20	718966
3/4/4,6 mm	EC 4/3 (envase de 3)	763438.30	718966



Marcas registradas

Kinetex® Phenomenex (USA)
 NUCLEOSHELL® MACHEREY-NAGEL GmbH & Co. KG (Alemania)

Su distribuidor local

www.mn-net.com

MACHEREY-NAGEL



Management System
 EN ISO 13485:2016
 ISO 9001:2015

www.tuv.com
 ID 0000056401



MACHEREY-NAGEL GmbH & Co. KG · Valencienner Str. 11 · 52355 Düren · Alemania

DE +49 24 21 969-0 info@mn-net.com
 CH +41 62 388 55 00 sales-ch@mn-net.com

FR +33 388 68 22 68 sales-fr@mn-net.com
 US +1 888 321 62 24 sales-us@mn-net.com