LT168

GL Sciences Inc.

Simultaneous analysis of pesticides in tap water using LC-MS/MS

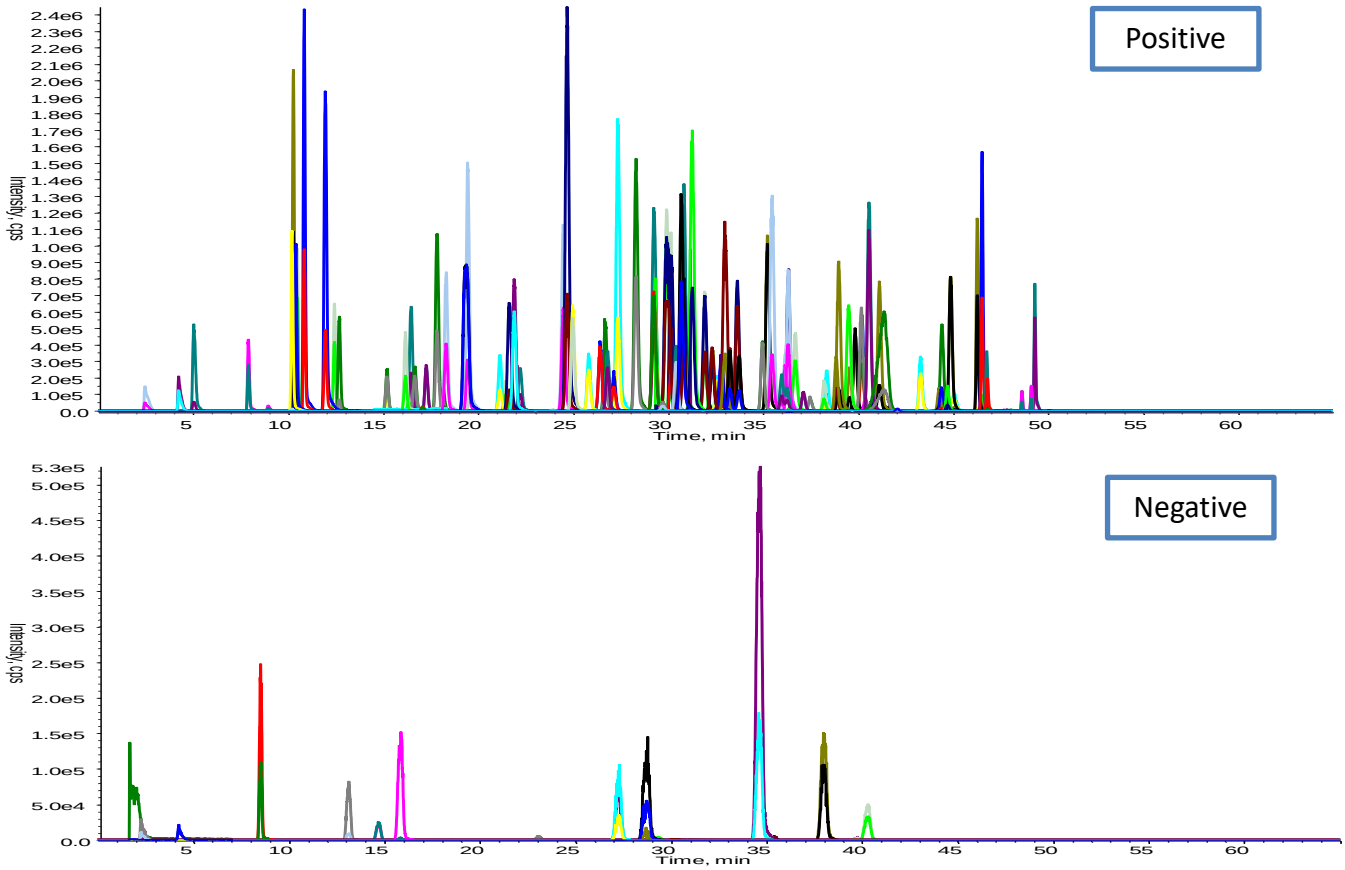
Overveiw

This application data represents an example of simultaneous analysis using a triple quadrupole LC-MS for 130 pesticides in water.

Reference standard solutions were added to water samples to achieve a concentration of 10 µg/L for each pesticide and were analyzed without sample preparation.

Utilizing the highly inert HPLC column InertSustain C18, all pesticides were detected with excellent peak shapes and superior separation.

Standard solution analysis example (4000QTRAP): 10µg/L each



System	LC : Nexera UFLC (Shimadzu), MS : 4000QTRAP (Sciex)
Column	Guard Colum for UHPLC InertSustain C18 (3µm, 10 × 2.1mm I.D.) ＋InertSustain C18 HP (3µm, 150 × 2.1mm I.D.)
Eluent	A) 5mmol/L CH_3COONH_4 in H_2O B) 5mmol/L CH_3COONH_4 in CH_3OH A/B = 90/10 – 7min – 55/45 – 35min – 20/80 – 4min – 0/100 (5min hold) – 4min - 90/10 (10min hold)
Flow Rate	0.2 mL/min
Injection Vol.	50 µL
Col. Temp.	40℃

Detection: MS/MS (ESI, Positive, Negative, SRM)

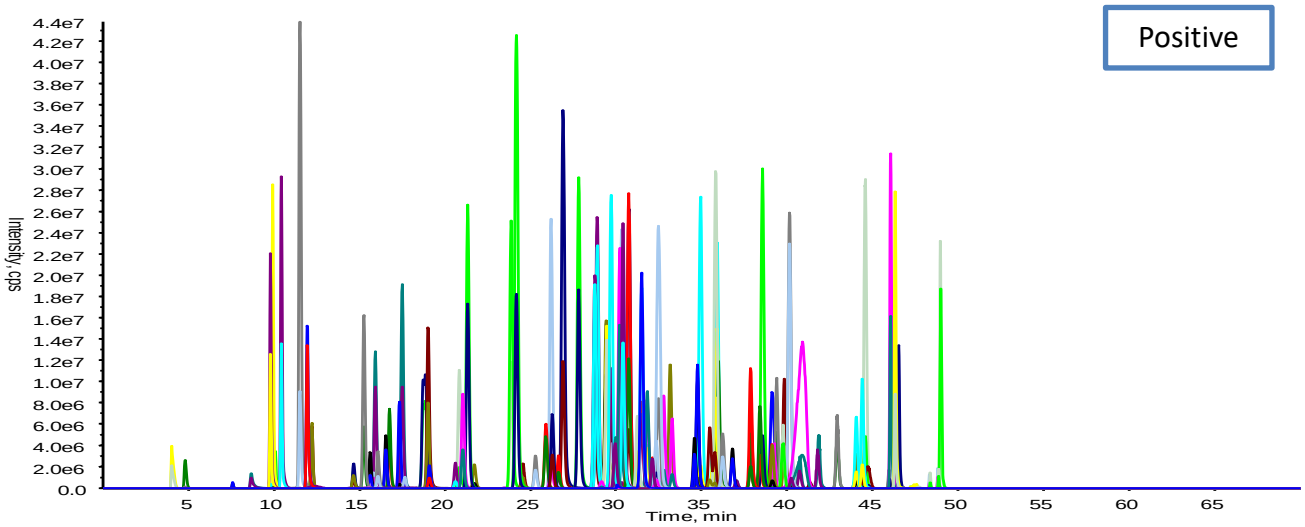
Positive

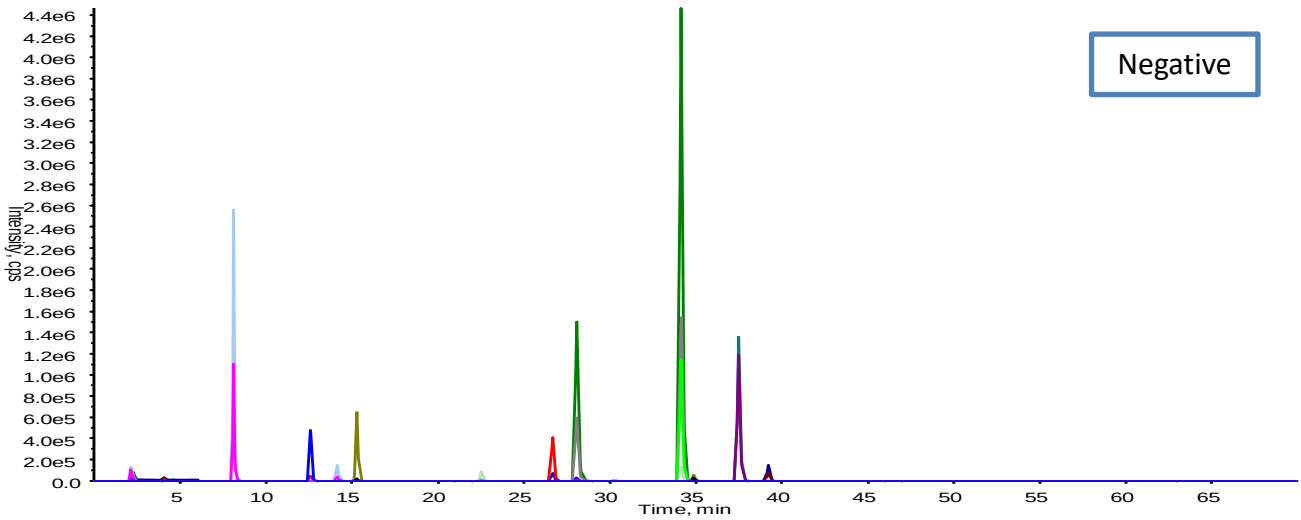
CUR	CAD	IS	TEM	GS1	GS2
30	7	4500	350	50	80

Negative

CUR	CAD	IS	TEM	GS1	GS2
20	7	-4000	450	20	50

Standard solution analysis example (QTRAP6500+): 10µg/L each





System	LC : ExionLC AD (Sciex), MS : QTRAP6500+ (Sciex)
Column	InertSustain C18 HP (3µm, 150 × 2.1mm I.D)
Eluent	A) 5mmol/L CH_3COONH_4 in H_2O B) 5mmol/L CH_3COONH_4 in CH_3OH A/B = 90/10 – 7min – 55/45 – 35min – 20/80 – 4min – 0/100 (5min hold) – 4min - 90/10 (10min hold)
Flow Rate	0.2 mL/min
Injection Vol.	30 µL
Col. Temp.	40℃
Detection	MS/MS (ESI, Positive, Negative, SRM)

Positive

CUR	CAD	IS	TEM	GS1	GS2
25	10	4500	400	70	70

Negative

CUR	CAD	IS	TEM	GS1	GS2
25	10	-4500	400	70	70

SRM condition example (R.T. is a condition for QTRAP 6500+)

Positive

No.	Compound	R.T.(min)	Transition		No.	Compound	R.T.(min)	Transition		No.	Compound	R.T.(min)	Transition	
1	Metamidophos	4.1	141.9 ->	94	40	Trichlophos Methyl Oxon	26.26	285.1 ->	109	79	Pyraclofos	37.91	361.1 ->	138.1
2	Acefate	4.82	184.1 ->	142.9	41	Azoxystrobin	26.89	404.3 ->	344	80	MPP	37.92	279 ->	247
3	Methomyl	7.58	163.4 ->	88.1	42	Isoxathione Oxon	27.81	298.2 ->	270	81	Phosalone	38.48	368.2 ->	111
4	Tefuriltrion	9.79	460.1 ->	340.9	43	Mepronil	28.77	270.2 ->	228.1	82	Pencycuron	38.55	329.1 ->	218
5	MPP Oxon Sulfoxide	9.86	279.1 ->	264	44	Daimuron	28.78	269.2 ->	91.1	83	Butamifos	39.17	333.1 ->	180
6	Flazasulfron	9.92	408.2 ->	182	45	Flatnyl	28.89	324.1 ->	242.1	84	Thiobencarb	39.18	258.2 ->	89
7	Trichlorfon	9.94	259.1 ->	109	46	Molinate	29.16	188.2 ->	126.1	85	Isofenphos	39.27	346.2 ->	287
8	Dimethoate	10.08	230.3 ->	124.9	47	Isoprothiolane	29.47	291.2 ->	230.9	86	Cadusafos	39.4	271 ->	158.9
9	MPP Oxon Sulfone	10.43	312.2 ->	294.9	48	Butamifos Oxon	29.49	317.2 ->	243.9	87	Terbucarb	39.79	295.2 ->	222.1
10	MBC	11.52	191.9 ->	132	49	Orysastrobin	29.71	392.2 ->	116	88	Isoxation	39.91	314.2 ->	104.9
11	Tricyclazole	11.95	190 ->	136	50	Cafenstrole	29.72	351.1 ->	72.1	89	Befenox	40.08	359.2 ->	310
12	Halosulfuron-methyl	12.22	435.2 ->	182.1	51	Z-Dimethylvinphos	29.95	333 ->	127	90	Piperophos	40.2	354.2 ->	255
13	Quinoclamine	14.65	208.1 ->	105	52	Malathion	30.05	348.2 ->	98.8	91	Tolchlofos-methyl	40.26	301 ->	269
14	Pyroquilon	14.66	174.2 ->	117	53	Mefenacet	30.23	299.1 ->	148	92	Disulfoton	40.57	275.1 ->	89
15	Thiophanate-methyl	15.25	343.1 ->	311	54	Isofenphos Oxon	30.33	330.2 ->	229	93	Dimepiperate	40.73	264.2 ->	146.1
16	Propoxur	15.62	210 ->	111	55	Pyridaphention	30.41	341.1 ->	189	94	Pretilachlor	40.93	312.2 ->	252
17	Dichlorvos	15.81	221.1 ->	109	56	Methyldaimuron	30.75	269.1 ->	134	95	Chlorpyrifos methyl	41.41	322.1 ->	124.9
18	Carbofuran	15.92	222.2 ->	165.1	57	Paclobutrazol	31.25	294.2 ->	69.9	96	ENP	41.84	324.1 ->	295.9
19	Simazine	16.07	202.3 ->	124.1	58	Fenitrothion	31.47	278.4 ->	125	97	Benfuracarb	42.95	411.2 ->	252.1
20	MalaOxon	16.54	315.2 ->	127	59	Bromobutide	31.8	314.1 ->	196	98	Cinmethylin	44.02	292.3 ->	105
21	Fenitrothione Oxon	16.75	262 ->	216	60	Napropamide	31.82	272.3 ->	129.1	99	Dithiopyr	44.05	402.2 ->	354.1
22	MPP Sulfoxide	17.33	295.1 ->	108.9	61	E-Dimethylvinphos	32.11	333 ->	127	100	Esprocarb	44.09	266.2 ->	91
23	Bensulfuron-methyl	17.48	411.2 ->	182	62	Uniconazole P	32.34	292.2 ->	70	101	Torfenpyrade	44.39	384.2 ->	197
24	NAC	17.64	202.2 ->	127	63	Thenylchlor	32.35	324.1 ->	127	102	Buprofezine	44.57	306.2 ->	57.1
25	Fosthiazate	18.8	284.2 ->	228	64	Metolachlor	32.47	284.2 ->	176.1	103	Butachlor	44.7	312.2 ->	57.1
26	MPP Sulfone	19.01	328.2 ->	311	65	Fenoxyanyl	32.9	329.2 ->	302	104	Alachlor	44.75	270.1 ->	238
27	Thiodicarb	19.09	355.3 ->	163	66	Chlorpyrifos Oxon	33.15	336.2 ->	279.8	105	Dichlofenthion	45.96	315 ->	258.8
28	Isoprocarb	20.62	194.1 ->	94.9	67	SAP	34.59	398.2 ->	313.8	106	Pyributicarb	46.05	331.2 ->	181
29	Atrazine	20.84	216.2 ->	174	68	Iprobenfos	34.75	289.1 ->	204.9	107	Pyriprocyfen	46.31	322.2 ->	78
30	Simetryn	21.05	214.2 ->	124.1	69	Etridiazol	34.75	247 ->	205	108	Chlorpyrifos	46.38	352 ->	200
31	Metaraxyl	21.33	280.2 ->	192	70	Dimethametryn	34.94	256.3 ->	186.1	109	Pendimethalin	46.56	282.2 ->	212.1
32	DCMU	21.72	233.2 ->	72	71	Propiconazole	35.51	342.2 ->	159	110	Propargite	46.57	368.2 ->	231.2
33	Benfuresate	23.45	274 ->	163	72	Carpdpamid	35.71	334.2 ->	139	111	Benfluralin	46.8	336.2 ->	236.1
34	Daiazinon Oxon	23.86	289.2 ->	153.1	73	Propaphos	35.85	305.2 ->	221	112	Trifluralin	46.81	336.3 ->	236
35	MPP Oxon	24.17	263.2 ->	231	74	Anilofos	35.92	368.1 ->	198.9	113	Cypermetryn	47.51	433.1 ->	416.1
36	Methidathion	24.55	320.2 ->	145	75	Edifenphos	36.03	311.1 ->	282.9	114	cis-Permetryn	48.37	408 ->	355
37	Fenobucarb	25.28	208.2 ->	94.9	76	Pyrazoxyfen	36.24	403.1 ->	91.1	115	trans-Permetryn	48.86	408 ->	355
38	Siduron	25.89	233 ->	137	77	Phenthoate	36.79	321.1 ->	247	116	Ethofenprox	49.03	394.3 ->	177.1
39	ENP Oxon	26.2	308.1 ->	93.9	78	Diazinon	37.91	305.2 ->	169.1					

Negative

No.	Compound	R.T.(min)	Transition	
1	Fosetyl	2.17	109 ->	81
2	Asulam	2.32	228.9 ->	132.9
3	Darapon	4.11	140.8 ->	96.7
4	Bentazon	8.13	238.9 ->	131.9
5	2,4-D	12.6	218.9 ->	161
6	Triclopyr	14.15	253.9 ->	195.9
7	MCPP	15.28	213 ->	140.9
8	Cyanophos	22.55	227.8 ->	117.8
9	Etyprol	26.7	394.9 ->	329.7
10	Propyzamide	28.1	253.8 ->	227.8
11	Procymidone	28.11	316 ->	255.6
12	Chlorothalonil	28.64	244.8 ->	174.7
13	Fthalide	30.29	270.8 ->	243
14	Fipronil	34.16	434.9 ->	329.8
15	Benzoepin sulfate	37.52	420.8 ->	96.6

analytical column

Product name	Particle size (μm)	Inner diameter (mm)	Length (mm)	Cat. No.
InertSustain C18 HP	3	2.1	150	5020-14415

guard column for UHPLC

Product name	Particle size (μm)	Inner diameter (mm)	Length (mm)	Cat. No.
Cartridge (2 pieces) + holder (1 piece) set InertSustain C18	3	2.1	10	5020−20374
Replacement cartridge (set of 2) InertSustainC18	3	2.1	10	5020−20323

Guard holder

replacement cartridge

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