

Tandem Quadrupole Mass Spectrometry

Sample Analysis Report

Customer: Singapore Food Agency

Samples: DR-STD
DR-BLK A, DR-BLK B
DR-SPK A, DR-SPK B

Instruments: ACQUITY UPLC I Class
Xevo TQ-XS

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1 Executive Summary

Screening of standards DR-STD

1. Standard DR-STD was screened using an MRM method that was established using Quanpedia. Out of the 250 potential compounds, 84 compounds were identified. **Table 1** contains the summary of the list of compounds being identified in DR-STD (0.1 ppm).
2. Calibration curves were established for all the detected analytes to further screen and quantitate for samples DR-BLK A, DR-BLK B, DR-SPK A and DR-SPK B. All calibration curves achieve good linearity of >0.995 .

Screening and quantitation of samples DR-BLK A, DR-BLK B, DR-SPK A and DR-SPK B

3. Triplicate analysis of the samples was performed. Total number of compounds identified in the samples are summarized as follow:
 - a. DR-SPK A: 32 drugs identified
 - b. DR-SPK B: 30 drugs identified
 - c. DR-BLK A: 5 drugs identified
 - d. DR-BLK B: 4 drugs identified
4. Quantitation result and identities of all the drugs detected in the samples are shown in **Table 2**.

Table 1: List of drugs identified in DR-STD (0.1 ppm)

DR-STD (0.1)ppm			
S/N	Drugs identified	S/N	Drugs identified
1	16-beta-hydroxy stanozolol	43	Lasalocid
2	17-alpha-methyltestosterone	44	Mabuterol
3	4-Epichlortetracycline	45	Maduramycin
4	4-Epioxytetracycline	46	Mapenterol
5	4-Epitetracycline	47	Marbofloxacin
6	5-Hydroxyflunixin	48	Metronidazole
7	6-alpha-Methylprednisolone	49	Metronidazole-hydroxy
8	Albendazole	50	Monensin
9	Altrenogest	51	Monepantel sulfone
10	Amoxicillin	52	Nafcillin
11	Ampicillin	53	Nandrolone
12	Brombuterol	54	Narasin
13	Buquinolate	55	Norfloxacin
14	Carbmazepine	56	Novobiocin
15	Cefalexin	57	Oxacillin
16	Cefazolin	58	Oxibendazole
17	Cefoperazone	59	Penicillin G
18	Ceftiofur	60	Penicillin V
19	Cephalothin	61	Prednisolone
20	Cephradine	62	Ractopamine
21	Chlortetracycline	63	Robenidin
22	Cimbuterol	64	Ronidazole
23	Clenbuterol	65	Salbutamol
24	Clenpenterol	66	Sarafloxacin
25	Clopidol	67	Stanozolol
26	Cloxacillin	68	Sulfadimethoxine/Sulfadoxine
27	Decoquinat	69	Sulfanilamide
28	Desacetylcefapirin	70	Terbutaline
29	Dexamethasone	71	Thiabendazole
30	Dicloxacillin	72	Tildipirosin
31	Difloxacin	73	Vancomycin
32	Dimetridazole	74	Virginiamycin
33	Doramectin	75	Zilpaterol
34	Doxycycline/Tetracycline	76	17-alpha-ethynylestradiol
35	Enrofloxacin	77	betamethasone
36	Epi-testosterone/Testosterone	78	Diclazuril
37	Eprinomectin	79	Diethylstilbesterol
38	Flumequine	80	Estradiol
39	Furazolidone	81	Estriol
40	Hydoxy dimetridazole	82	Estrone
41	Ipronidazole	83	Ethyl estradiol
42	Ipronidazole hydroxy	84	Nicarbazin

Table 2: List of drugs identified and the amount present in sample (DR-SPK A, DR-SPK B, DR-BLK A and DR-BLK B)

S/N	DR-SPK A		S/N	DR-SPK B		S/N	DR-SPK A		S/N	DR-SPK B			
	Drugs identified	Conc (ppb)		Drugs identified	Conc (ppb)		Drugs identified	Conc (ppb)		Drugs identified	Conc (ppb)		
1	16-beta-hydroxy stanozolol	3.02	1	16-beta-hydroxy stanozolol	2.7	24	Salbutamol	0.12	24	Stanozolol	1.7		
2	4-epioxytetracycline	2.07	2	4-epioxytetracycline	3.0	25	Stanozolol	2.72	25	Sulfanilamide	67.9		
3	Albendazole	309.19	3	Albendazole	58.2	26	Sulfanilamide	84.70	26	Zilpaterol	0.1		
4	Altrenogest	0.08	4	Amoxicillin	1.0	27	Zilpaterol	0.12	27	betamethasone	0.7		
5	Amoxicillin	0.51	5	Ampicillin	1.6	28	betamethasone	2.72	28	Diethylstilbesterol	0.3		
6	Ampicillin	0.80	6	Chlortetracycline	39.4	29	Diethylstilbesterol	1.06	29	Ethyl estradiol	0.2		
7	Chlortetracycline	21.63	7	Clenbuterol	0.2	30	Estrone	0.06	30	17-alpha-ethylnylestradiol	0.3		
8	Clenbuterol	0.22	8	Dexamethasone	6.7	31	Ethyl estradiol	1.04					
9	Dexamethasone	6.78	9	Dimetridazole	0.7	32	17-alpha-ethylnylestradiol	1.08					
10	Dimetridazole	0.92	10	Epi-testosterone/Testosterone	13.9								
11	Furazolidone	752.13	11	Furazolidone	773.8								
12	Hydoxy dimetridazole	0.35	12	Hydoxy dimetridazole	0.3								
13	Ipronidazole	1.22	13	Ipronidazole	1.2	S/N	DR-BLK A		S/N	DR-BLK B			
14	Maduramycin	2.51	14	Maduramycin	3.8		Drugs identified	Conc (ppb)		Drugs identified	Conc (ppb)		
15	Metronidazole	0.34	15	Metronidazole	0.3	1	Albendazole	130.1	1	Albendazole	49.4		
16	Metronidazole-hydroxy	0.28	16	Metronidazole-hydroxy	0.3	2	Altrenogest	0.1	2	Furazolidone	363.1		
17	Monensin	4.89	17	Monensin	5.4	3	Furazolidone	428.1	3	Sulfanilamide	78.5		
18	Nandrolone	2.28	18	Nandrolone	2.1	4	Monensin	0.1	4	17-alpha-ethylnylestradiol	0.3		
19	Novobiocin	8.65	19	Novobiocin	8.5	5	Sulfanilamide	79.1					
20	Oxibendazole	23.56	20	Penicillin V	28.1								
21	Penicillin V	25.94	21	Prednisolone	8.4								
22	Prednisolone	6.48	22	Ractopamine	0.2								
23	Ractopamine	0.14	23	Salbutamol	0.1								

2 Instrument Methods

2.1 UPLC Method

This method was used for screening and quantitation of drug residues in the standard (DR-STD) and samples (DR-BLK A, DR-BLK B, DR-SPK A and DR-SPK B). The UPLC system coupled to the MS system was ACQUITY UPLC I-Class System (SM-FTN). The UPLC conditions are as follows:

Binary Solvent Manager

- a. Analytical column: Acquity UPLC CSH C18, 1.7 μ m, 100 $\times$ 2.1 mm column
- b. Injection volume: 10 μ L
- c. Flow rate: 0.4 mL/min
- d. Mobile phase:
 - For positive ionization: A – 0.1% formic acid in H₂O
B – 0.1% formic acid in ACN:MeOH (50:50)
 - For negative ionization: A – H₂O
B – ACN
- e. Mobile phase gradient: 1% B (0.0 min) $\rightarrow$ 20% B (4.0 min) $\rightarrow$ 50% B (5.0 min) $\rightarrow$ 99% B (7.0 to 9.0 min) $\rightarrow$ 1% B (9.1 to 12.0 min)

Sample Manager FTN

- a. Wash solvent: 50:30:40 water:acetonitrile: IPA
- b. Purge solvent: 10% ACN in water
- c. Sample temperature: 8 $^{\circ}$ C
- d. Column temperature: 40 $^{\circ}$ C

2.2 MS Method

2.2.1 Setting up a screening method for potential drugs substance in sample

The MRM method for the screening of drugs was established using information based on Quanpedia. Triplicate experiments of screening were performed on samples (DR-BLK A, DR-BLK B, DR-SPK A and DR-SPK B), Results obtained were then process using Targetlynx Software.

The MS system was Xevo TQ-XS. The instrument setting is as follows:

- ❖ Capillary voltage: 3.10 kV (ESI positive), 2.50 kV (ESI negative)
- ❖ Source temperature: 150 °C
- ❖ Desolvation temperature: 400 °C
- ❖ Cone gas flow: 150 L/h
- ❖ Nebuliser gas flow: 7 bar
- ❖ Desolvation gas flow: 1000 L/h

3 Results

3.1 Screening of potential compounds in DR-STD (0.1 ppm)

A list of 250 compounds containing various classes of drugs such as coccidiostatic agents, anti-biotics, beta-agonists, macrolides and glycopeptide antibiotic is provided. 2 MRM transition was used for screening of the potential compounds in the DR-STD. A total of 84 compounds, 75 in positive ionization mode and 9 in negative ionization mode, were identified in DR-STD. **Table 3** show the compounds identified in the mixture along with the MRM transition used. Due to some suspected compounds being isomers and having the same fragmentation patterns, they are both being suspected due to the lack of retention time information. **Figure 1** display the MRM chromatogram of the detected compounds at 10 ppb.

Table 3. List of detected compounds in DR-STD using MRM method with 2 MRM transitions

No	Compound	RT (min)	Quantifier Trace	Reference Trace	No	Compound	RT (min)	Quantifier Trace	Reference Trace
1	16-beta-hydroxy stanozolol	6.38	345.1 > 81	345.1 > 95	7	6-alpha-Methylprednisolone	6.43	375.4 > 357.3	375.4 > 339.3
2	17-alpha-methyltestosterone	7.22	303.1 > 97	303.1 > 97	8	Albendazole	6.14	265.9 > 234.1	265.9 > 191.2
3	4-Epichlortetracycline	4.45	479.3 > 444.2	479.3 > 462.2	9	Altrenogest	7.04	311 > 269	311 > 227
4	4-Epioxytetracycline	4.05	461.1 > 426.1	461.1 > 443.2	10	Amoxicillin	2.16	366.1 > 349	366.1 > 133.7
5	4-Epitetracycline	3.21	445.1 > 410.1	445.1 > 427.3	11	Ampicillin	3.84	350.1 > 105.9	350.1 > 159.9
6	5-Hydroxyflunixin	7.04	313 > 226	313 > 252	12	Brombuterol	4.75	367.1 > 214	367.1 > 293.1

No	Compound	RT (min)	Quantifier Trace	Reference Trace	No	Compound	RT (min)	Quantifier Trace	Reference Trace
13	Buqinolate	6.20	361.8 > 260.2	361.8 > 204	28	Desacetylcefapirin	1.95	382 > 226	382 > 292
14	Carbmazepine	6.43	237 > 193	237 > 194	29	Dexamethasone	6.43	393.3 > 355.2	393.3 > 373.2
15	Cefalexin	3.65	348.2 > 158	348.2 > 139.9	30	Dicloxacillin	6.76	470 > 211.9	470 > 254
16	Cefazolin	5.60	455.1 > 323	455.1 > 156	31	Difloxacin	4.63	400.3 > 356.2	400.3 > 382.2
17	Cefoperazone	5.79	646.1 > 142.8	646.1 > 530.1	32	Dimetridazole	2.90	142 > 95.8	142 > 80.9
18	Ceftiofur	5.97	524.2 > 241.2	524.2 > 285	33	Doramectin	7.80	916.9 > 145	916.9 > 331.3
19	Cephalothin	6.20	419 > 315	419 > 359	34	Doxycycline/Tetracycline	3.21	445.2 > 410.1	445.2 > 428.1
20	Cephradine	4.10	350.1 > 158	350.1 > 176	35	Enrofloxacin	4.22	360.3 > 316.3	360.3 > 342.3
21	Chlortetracycline	5.22	479.1 > 444.1	479.1 > 462.1	36	Epi- testosterone/Testosterone	6.82	289.1 > 97	289.1 > 109
22	Cimbuterol	2.22	234.2 > 143	234.2 > 160	37	Eprinomectin	7.80	914.8 > 154	914.8 > 186.1
23	Clenbuterol	4.08	277.1 > 168.1	277.1 > 140	38	Flumequine	1.76	262.1 > 244	262.1 > 202
24	Clenpenterol	5.05	291.1 > 203	293.1 > 205	39	Furazolidone	6.49	226.2 > 139.2	226.2 > 122
25	Clopidol	3.76	192 > 101	192 > 103	40	Hydoxy dimetridazole	2.51	158 > 140.1	158 > 112
26	Cloxacillin	6.67	436.2 > 159.9	436.2 > 276.9	41	Ipronidazole	5.53	170 > 124	170 > 109.1
27	Decoquinat	7.76	418.3 >204.1	418.3 > 372.3	42	Ipronidazole hydroxy	4.96	186.1 > 127.9	186.1 > 167.9

No	Compound	RT (min)	Quantifier Trace	Reference Trace	No	Compound	RT (min)	Quantifier Trace	Reference Trace
43	Lasalocid	8.15	613.4 > 377.4	613.4 > 577.4	58	Oxibendazole	5.45	250 > 176.1	250 > 218.1
44	Mabuterol	4.97	311.1 > 217.1	311.1 > 237.1	59	Penicillin G	6.31	335.1 > 160	335.1 > 176
45	Maduramycin	8.17	939.5 > 877.6	939.5 > 719.5	60	Penicillin V	6.49	351.1 > 160.1	351.1 > 114
46	Mapenterol	5.35	325.1 > 237.1	325.1 > 217.1	61	Prednisolone	6.20	361.2 > 147	361.2 > 343.2
47	Marbofloxacin	3.30	363.1 > 72	363.1 > 320	62	Ractopamine	3.88	302.2 > 164.1	302.2 > 284.2
48	Metronidazole	2.64	172 > 82	172 > 128	63	Robenidin	6.10	334.2 > 111.1	334.2 > 155.2
49	Metronidazole-hydroxy	2.16	188 > 126	188 > 143.9	64	Ronidazole	3.00	201 > 140	201 > 55
50	Monensin	8.08	693.5 > 461.4	693.5 > 501.4	65	Salbutamol	1.78	240.2 > 148.1	240.2 > 222.1
51	Monepantel sulfone	6.76	504 > 186	504 > 165.9	66	Sarafloxacin	4.64	386.2 > 342.1	386.2 > 299.1
52	Nafcillin	6.75	415.2 > 199.2	415.2 > 171.1	67	Stanozolol	6.92	329 > 81	329 > 121
53	Nandrolone	6.69	275 > 109	275 > 257	68	Sulfadimethoxine/Sulfadoxine	7.04	311 > 156	311 > 92
54	Narasin	8.29	787.6 > 431.3	787.6 > 531.3	69	Sulfanilamide	5.28	173 > 156	173 > 92
55	Norfloxacin	3.68	320.1 > 233	320.1 > 276.1	70	Terbutaline	1.66	226.1 > 107	226.1 > 125
56	Novobiocin	7.41	613 > 189	613 > 133	71	Thiabendazole	5.35	202 > 130.9	202 > 174.9
57	Oxacillin	6.56	402.2 > 160	402.2 > 243.1	72	Tildipirosin	8.18	734.6 > 174	734.6 > 132

No	Compound	RT (min)	Quantifier Trace	Reference Trace
73	Vancomycin	2.99	725.8 > 100	725.8 > 144.2
74	Virginiamycin	6.56	526.4 > 508.3	526.4 > 355.1
75	Zilpaterol	1.76	262.2 > 185.1	262.2 > 202.1
76 ^a	17-alpha-ethynylestradiol	6.37	295.2 > 145.1	295.2 > 158.9
77 ^a	betamethasone	5.87	361.2 > 307.2	361.2 > 325.2
78 ^a	Diclazuril	6.80	405.1 > 334.1	407.1 > 336.1

No	Compound	RT (min)	Quantifier Trace	Reference Trace
79 ^a	Diethylstilbesterol	6.52	267.1 > 237.1	267.1 > 251.1
80 ^a	Estradiol	6.24	271.2 > 145.1	271.1 > 183.1
81 ^a	Estriol	5.53	287.2 > 145	287.2 > 171
82 ^a	Estrone	6.40	269.2 > 145.1	269.2 > 269
83 ^a	Ethyl estradiol	6.37	295 > 145	295 > 269
84 ^a	Nicarbazin	6.47	301 > 107.1	301 > 137.2

Note: ^a are compounds that are detected in negative mode

Figure 1(a) MRM chromatograms of detected compounds in DR-STD at 10ppb (Compound 1 ~ 12)

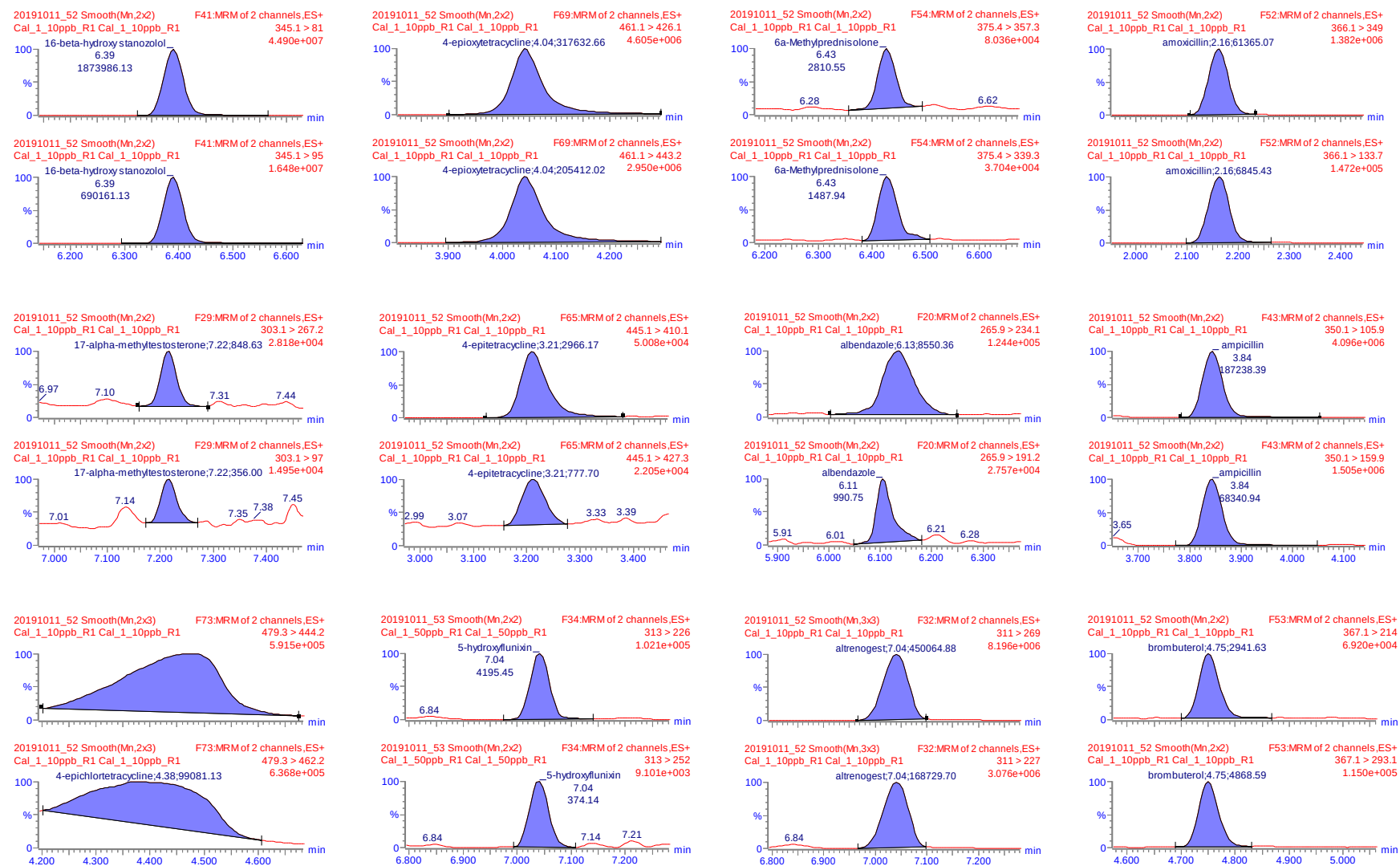


Figure 1(b) MRM chromatograms of detected compounds in DR-STD at 10ppb (Compound 13 ~ 24)

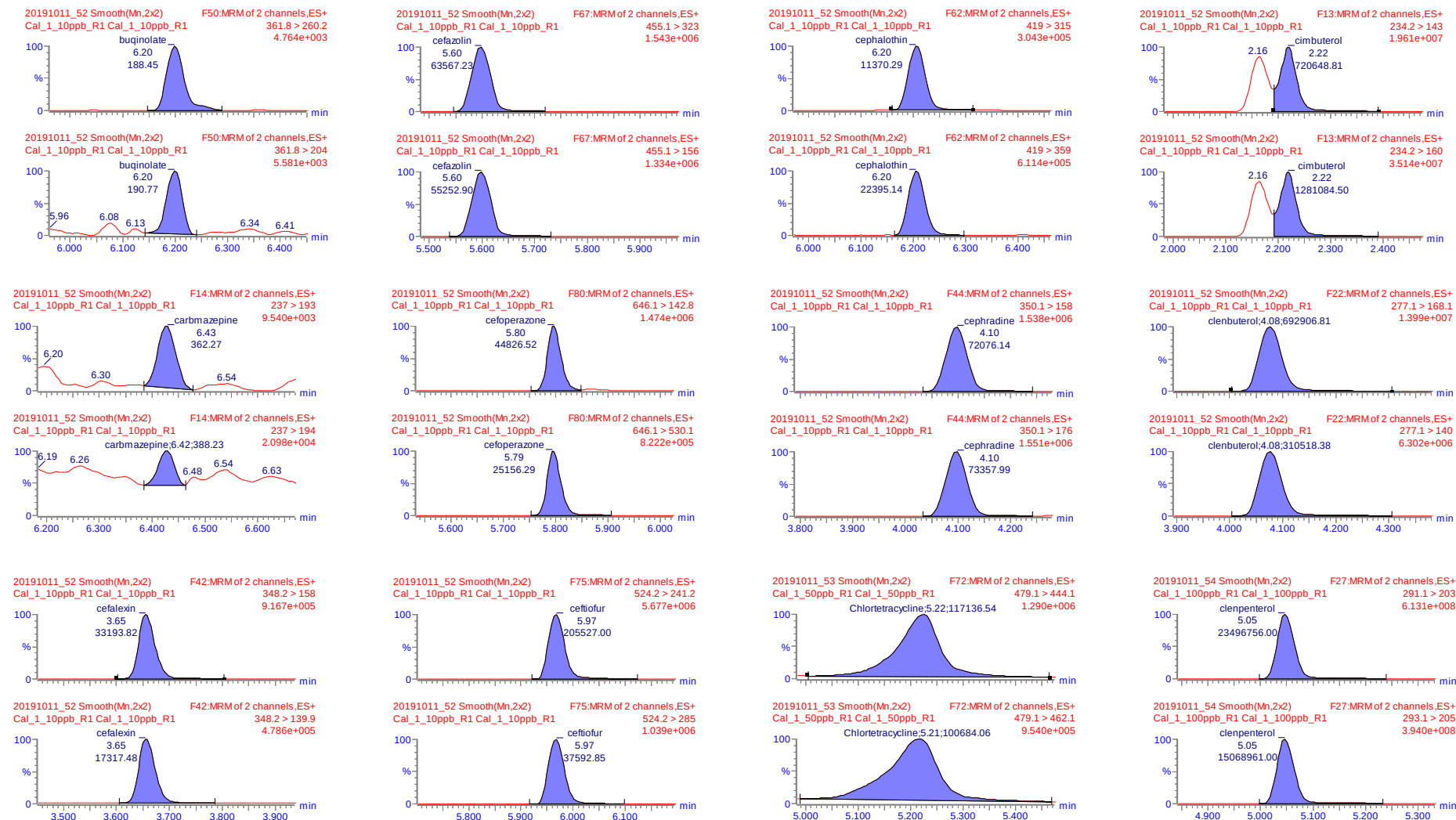


Figure 1 (c) MRM chromatograms of detected compounds in DR-STD at 10ppb (Compound 25 ~ 36)

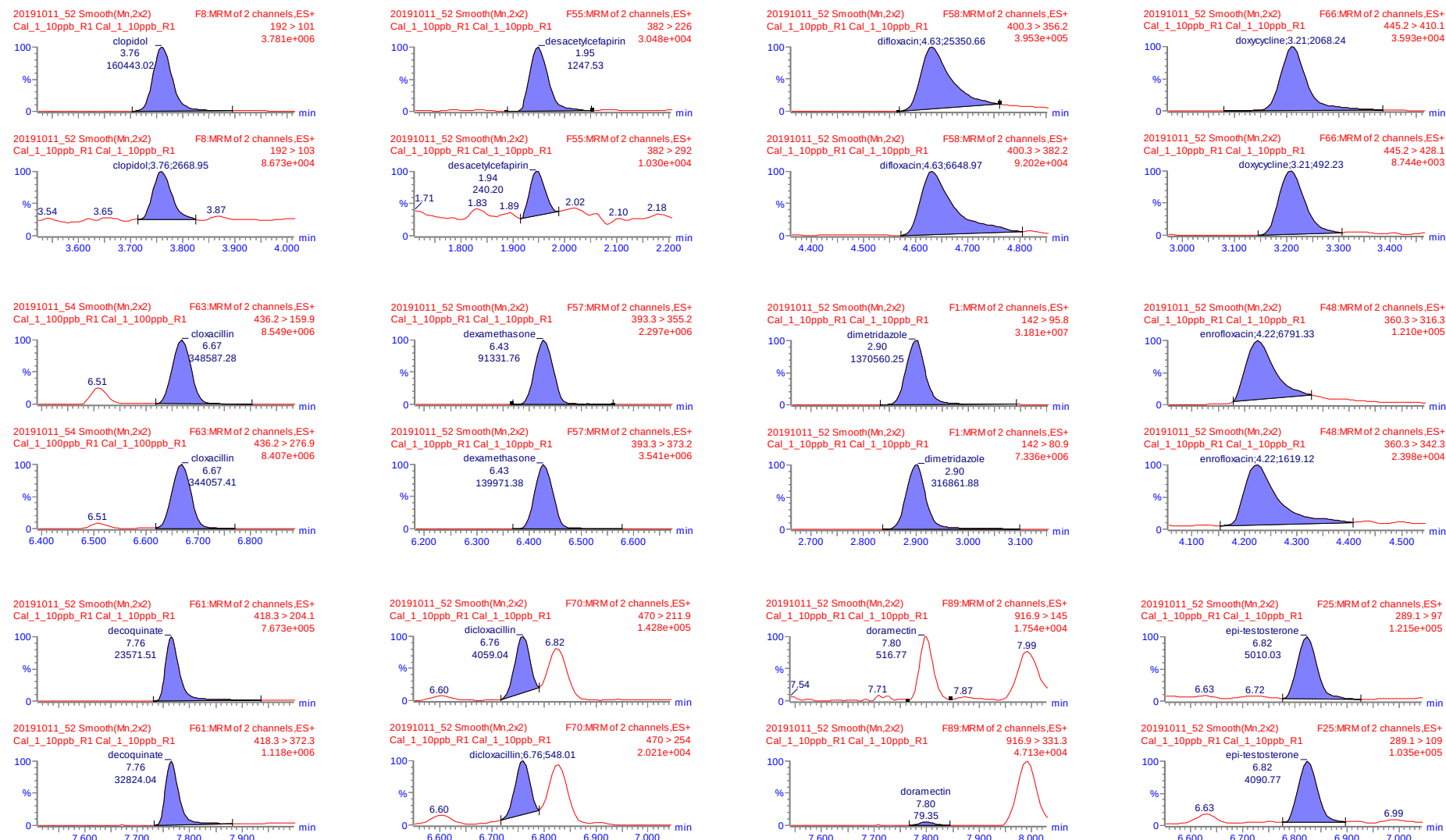


Figure 1(d) MRM chromatograms of detected compounds in DR-STD at 10ppb (Compound 37 ~ 48)

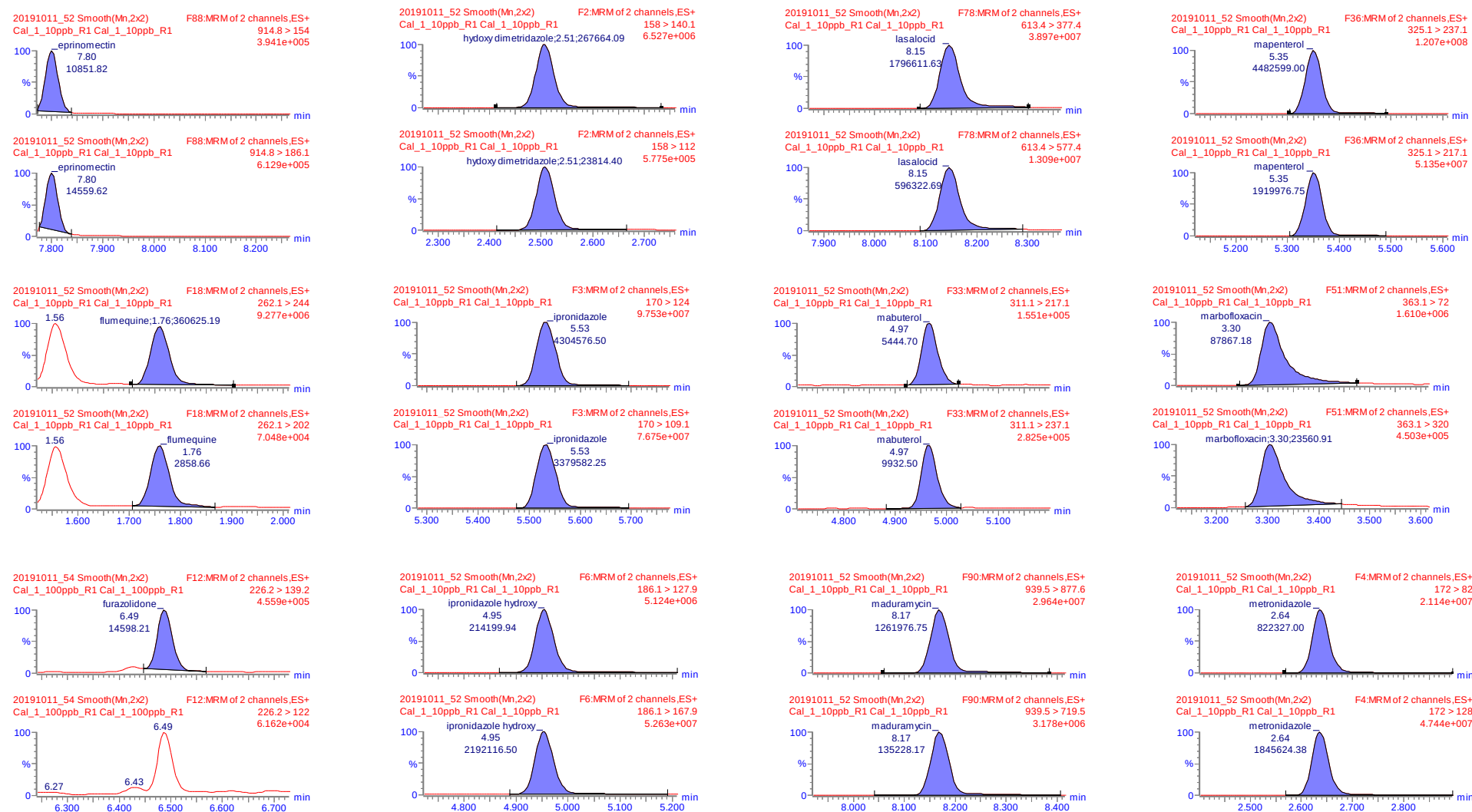


Figure 1(e) MRM chromatograms of detected compounds in DR-STD at 10ppb (Compound 49 ~ 60)

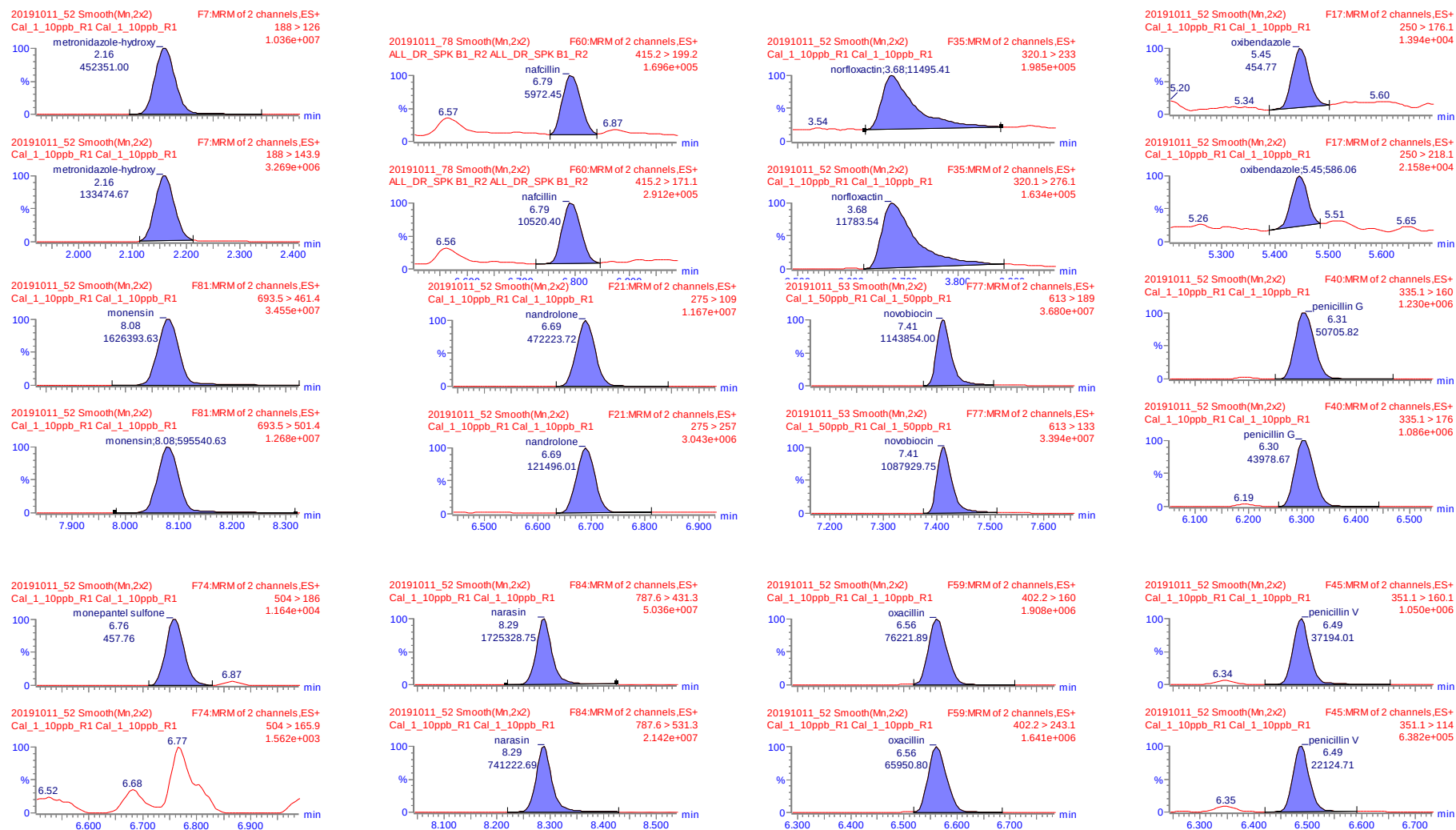


Figure 1 (f) MRM chromatograms of detected compounds in DR-STD at 10ppb (Compound 61 ~ 72)

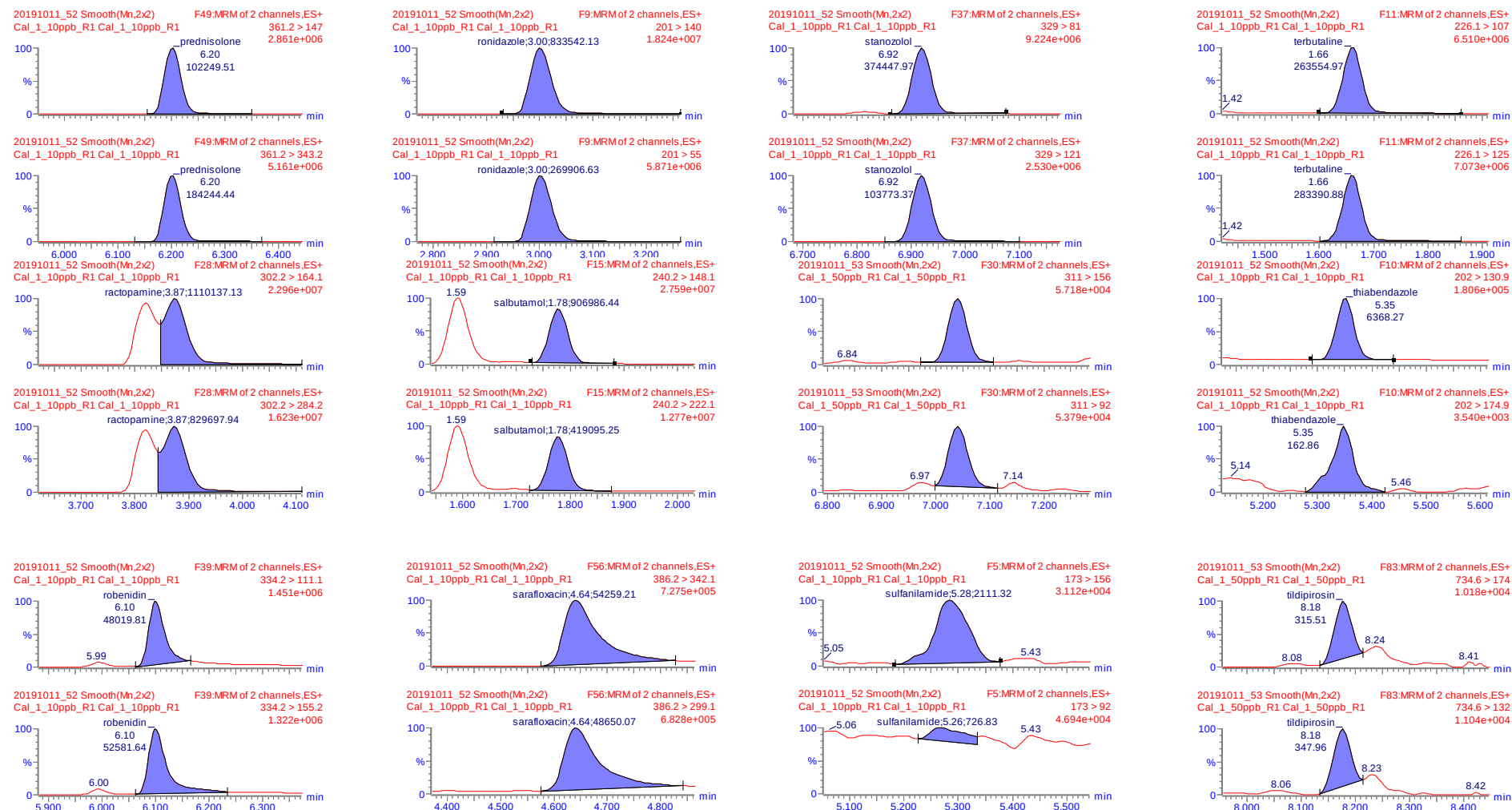
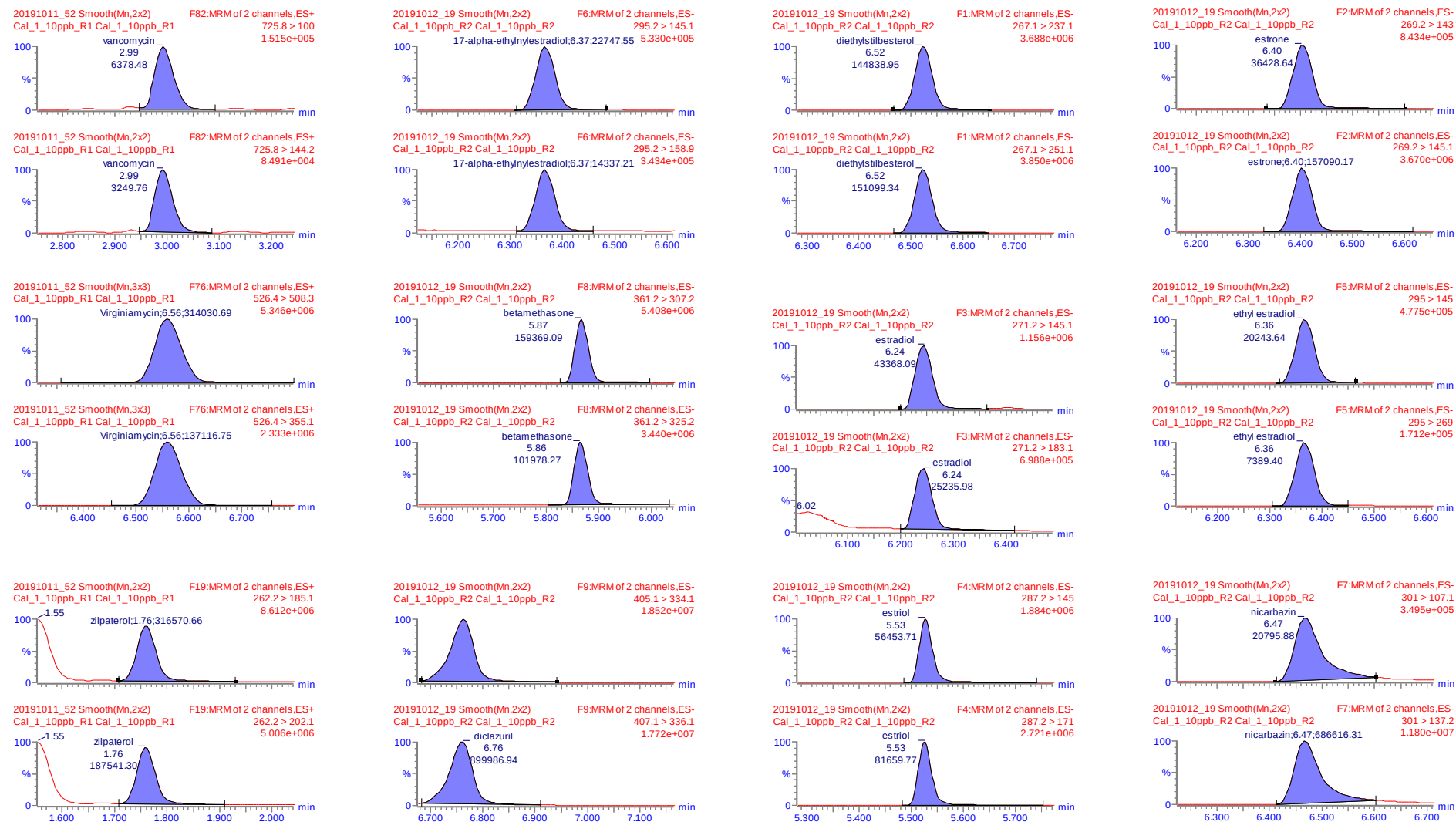


Figure 1(q) MRM chromatograms of detected compounds in DR-STD at 10ppb (Compound 73 ~ 84)



3.2 Setting up a screening and quantitation method for samples (DR-BLK A, DR-BLK B, DR-SPK A, DR-SPK B)

The standard mixture, DR-STD, was diluted with 10% MeOH into various concentrations: 0.02 ppb, 0.1 ppb, 1 ppb, 10 ppb, 50 ppb and 100 ppb. A calibration curve using the quantitation trace was established for quantitation of compounds that was spiked into the samples. Due to the different response for the different classes of compounds in the mixture, each analyte has different calibration ranges. **Table 4** shows the range and linearity of the 84 compounds. **Figure 2** shows the calibration curves of the individual analytes in neat solution.

Table 4. Calibration range and linearity of detected compounds in DR-STD

No	Compound	Linearity	Range (ppb)	No	Compound	Linearity	Range (ppb)
1	16-beta-hydroxy stanozolol	0.999	0.1 ~ 100	11	Ampicillin	1.000	0.02 ~ 100
2	17-alpha-methyltestosterone	0.999	10 ~ 100	12	Brombuterol	1.000	1 ~ 100
3	4-Epichlortetracycline	0.999	0.1 ~ 100	13	Buquinolate	0.999	10 ~ 100
4	4-Epioxytetracycline	0.999	0.1 ~ 100	14	Carbamazepine	0.999	10 ~ 100
5	4-Epitetracycline	0.999	10 ~ 100	15	Cefalexin	1.000	0.1 ~ 100
6	5-Hydroxyflunixin	0.997	10 ~ 100	16	Cefazolin	1.000	0.1 ~ 100
7	6-alpha-Methylprednisolone	1.000	10 ~ 100	17	Cefoperazone	1.000	0.02 ~ 100
8	Albendazole	1.000	1 ~ 100	18	Ceftiofur	1.000	0.02 ~ 100
9	Altrenogest	1.000	0.02 ~ 10	19	Cephalothin	1.000	1 ~ 100
10	Amoxicillin	1.000	0.02 ~ 100	20	Cephradine	1.000	0.02 ~ 100

No	Compound	Linearity	Range (ppb)	No	Compound	Linearity	Range (ppb)
21	Chlortetracycline	0.999	1 ~ 100	36	Epi-testosterone/Testosterone	1.000	10 ~ 100
22	Cimbuterol	0.999	0.02 ~ 50	37 ^B	Eprinomectin	-	50 ~ 100
23	Clenbuterol	0.999	0.02 ~ 50	38	Flumequine	0.9978	1 ~ 100
24	Clenpenterol	0.998	0.02 ~ 100	39	Furazolidone	1.000	10 ~ 100
25	Clopidol	1.000	0.1 ~ 10	40	Hydroxy dimetridazole	1.000	0.02 ~ 100
26	Cloxacillin	0.999	0.1 ~ 100	41	Ipronidazole	1.000	0.1 ~ 10
27	Decoquate	0.997	10 ~ 100	42	Ipronidazole hydroxy	1.000	0.02 ~ 100
28	Desacetylcefapirin	0.999	10 ~ 100	43	Lasalocid	1.000	0.02 ~ 10
29	Dexamethasone	1.000	0.1 ~ 10	44	Mabuterol	1.000	1 ~ 100
30	Dicloxacillin	1.000	1 ~ 100	45	Maduramycin	0.997	0.1 ~ 10
31	Difloxacin	0.992	10 ~ 100	46	Mapenterol	0.998	0.02 ~ 50
32	Dimetridazole	0.9994	0.02 ~ 50	47 ^B	Marbofloxacin	-	50 ~ 100
33 ^B	Doramectin	-	50 ~ 100	48	Metronidazole	0.998	0.02 ~ 50
34	Doxycycline/Tetracycline	0.998	1 ~ 100	49	Metronidazole-hydroxy	1.000	0.02 ~ 100
35 ^B	Enrofloxacin	-	50 ~ 100	50	Monensin	0.999	0.1 ~ 10

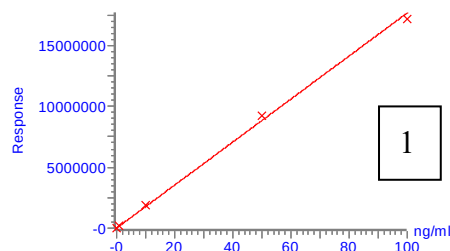
No	Compound	Linearity	Range (ppb)	No	Compound	Linearity	Range (ppb)
51	Monepantel sulfone	1.000	0.1 ~ 10	66	Sarafloxacin	0.997	10 ~ 100
52	Nafcillin	1.000	0.02 ~ 100	67	Stanozolol	0.998	1 ~ 100
53	Nandrolone	0.999	0.1 ~ 100	68	Sulfadimethoxine/Sulfadoxine	0.997	10 ~ 100
54	Narasin	0.995	0.02 ~ 10	69	Sulfanilamide	1.000	1 ~ 100
55 ^B	Norfloxacin	-	50 ~ 100	70	Terbutaline	1.000	0.02 ~ 10
56	Novobiocin	0.998	0.1 ~ 50	71	Thiabendazole	1.000	10 ~ 100
57	Oxacillin	1.000	0.1 ~ 100	72	Tildipirosin	0.996	10 ~ 100
58	Oxibendazole	1.000	10 ~ 100	73	Vancomycin	1.000	1 ~ 100
59	Penicillin G	1.000	0.1 ~ 100	74	Virginiamycin	0.999	0.1 ~ 100
60	Penicillin V	1.000	0.1 ~ 100	75	Zilpaterol	1.000	0.1 ~ 10
61	Prednisolone	1.000	0.02 ~ 100	76	17-alpha-ethynylestradiol	0.999	0.1 ~ 50
62	Ractopamine	0.999	0.02 ~ 50	77	betamethasone	1.000	0.02 ~ 10
63	Robenidin	0.996	10 ~ 100	78	Diclazuril	0.999	0.1 ~ 10
64	Ronidazole	0.999	0.02 ~ 50	79	Diethylstilbestrol	1.000	0.1 ~ 10
65	Salbutamol	1.000	0.02 ~ 10	80	Estradiol	0.997	10 ~ 100

No	Compound	Linearity	Range (ppb)	No	Compound	Linearity	Range (ppb)
81	Estriol	1.000	0.1 ~ 10	83	Ethyl estradiol	0.999	0.1 ~ 50
82	Estrone	1.000	0.02 ~ 50	84	Nicarbazin	0.998	1 ~ 100

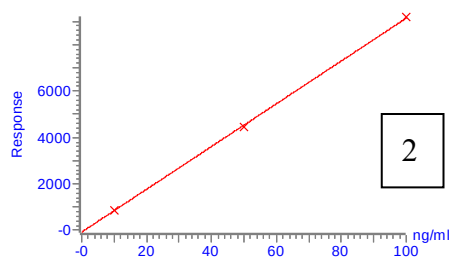
Note: ^B refers to compound having only 2 calibration points, thus linearity is not provided.

Figure 2(a) Calibration curve of 84 compounds found in DR-STD (Compound 1 ~ 12)

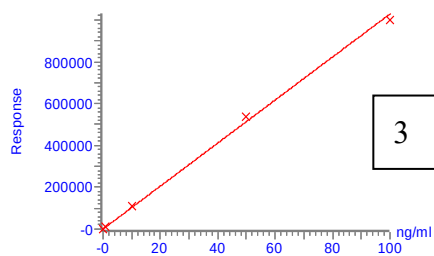
Compound name: 16-beta-hydroxystanozolol
Correlation coefficient: $r = 0.999353$, $r^2 = 0.998707$
Calibration curve: $176851 * x + -5447.77$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



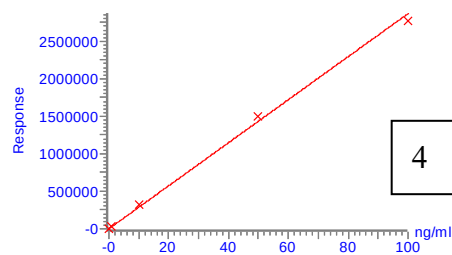
Compound name: 17-alpha-methyltestosterone
Correlation coefficient: $r = 0.999933$, $r^2 = 0.999865$
Calibration curve: $92.1705 * x + -79.7082$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



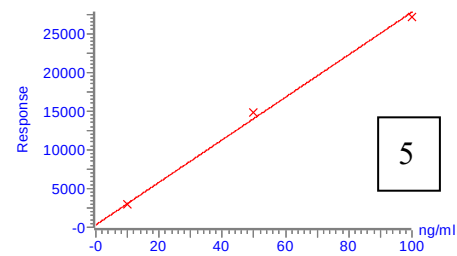
Compound name: 4-epichlortetracycline
Correlation coefficient: $r = 0.999225$, $r^2 = 0.998451$
Calibration curve: $10287.7 * x + -228.945$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



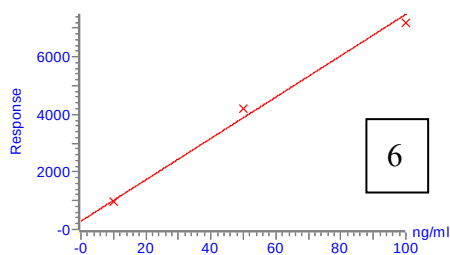
Compound name: 4-epioxytetracycline
Correlation coefficient: $r = 0.998911$, $r^2 = 0.997822$
Calibration curve: $28682.5 * x + 29.8162$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



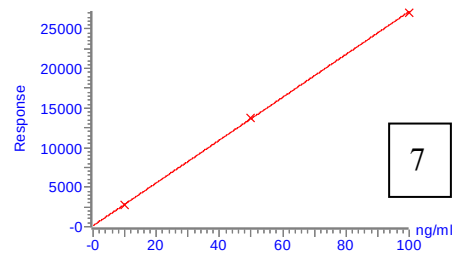
Compound name: 4-epitetracycline
Correlation coefficient: $r = 0.998699$, $r^2 = 0.997400$
Calibration curve: $274.31 * x + 309.927$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



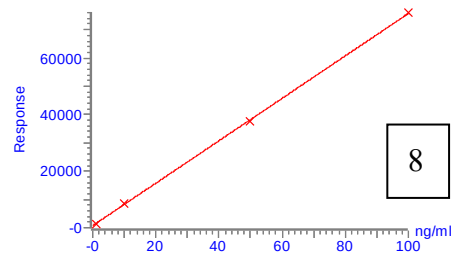
Compound name: 5-hydroxyflunixin
Correlation coefficient: $r = 0.996970$, $r^2 = 0.993949$
Calibration curve: $71.8778 * x + 288.54$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



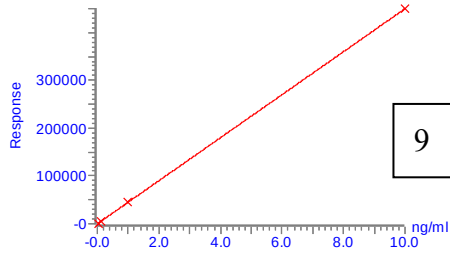
Compound name: 6a-Methylprednisolone
Correlation coefficient: $r = 0.999954$, $r^2 = 0.999909$
Calibration curve: $270.72 * x + 119.391$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



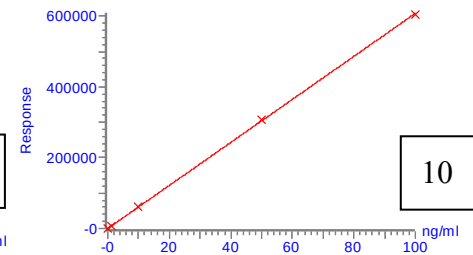
Compound name: albendazole
Correlation coefficient: $r = 0.999873$, $r^2 = 0.999747$
Calibration curve: $750.397 * x + 705.993$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



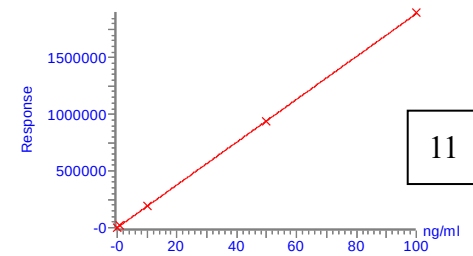
Compound name: altrenogest
Correlation coefficient: $r = 0.999991$, $r^2 = 0.999981$
Calibration curve: $44992.3 * x + -35.7749$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: amoxicillin
Correlation coefficient: $r = 0.999957$, $r^2 = 0.999914$
Calibration curve: $6076.32 * x + -5.48141$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: ampicillin
Correlation coefficient: $r = 0.999975$, $r^2 = 0.999950$
Calibration curve: $18879 * x + -37.4873$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: brombuterol
Correlation coefficient: $r = 0.999708$, $r^2 = 0.999417$
Calibration curve: $320.131 * x + -94.0251$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

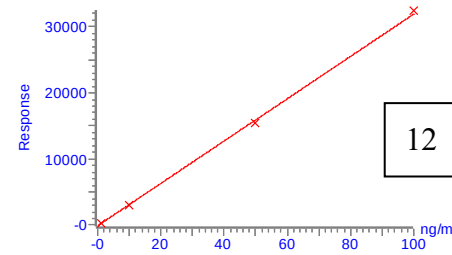
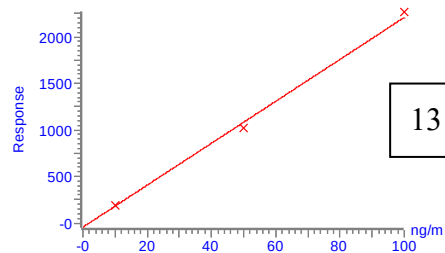
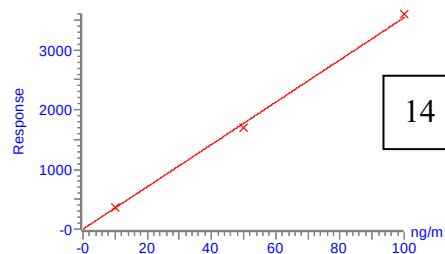


Figure 2(b) Calibration curve of 84 compounds found in DR-STD (Compound 13 ~ 24)

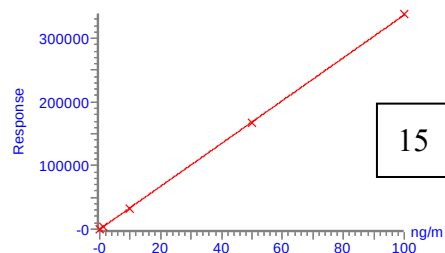
Compound name: buginolate
Correlation coefficient: $r = 0.998624$, $r^2 = 0.997251$
Calibration curve: $22.5274 * x + -44.1561$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



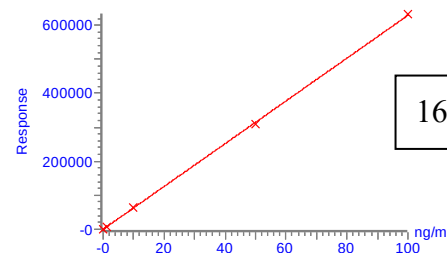
Compound name: carbamazepine
Correlation coefficient: $r = 0.999446$, $r^2 = 0.998892$
Calibration curve: $35.4289 * x + 0.664068$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



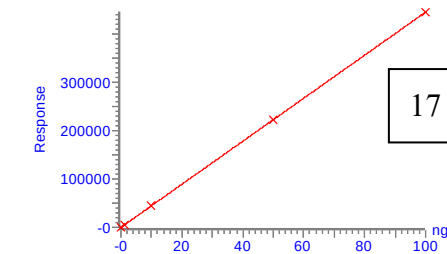
Compound name: cefalexin
Correlation coefficient: $r = 0.999982$, $r^2 = 0.999964$
Calibration curve: $3368.29 * x + -11.2772$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



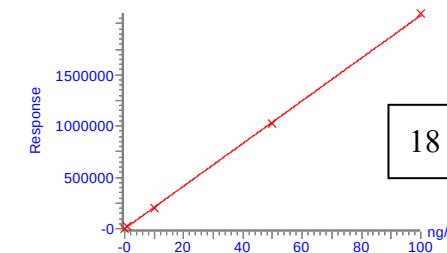
Compound name: cefazolin
Correlation coefficient: $r = 0.999955$, $r^2 = 0.999910$
Calibration curve: $6287.99 * x + 26.397$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



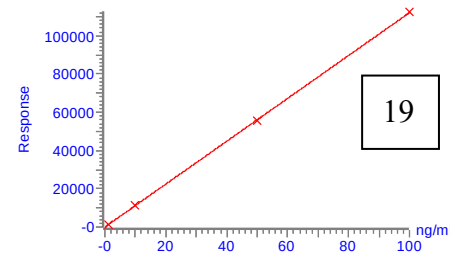
Compound name: cefoperazone
Correlation coefficient: $r = 0.999989$, $r^2 = 0.999979$
Calibration curve: $4438.68 * x + 6.29429$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



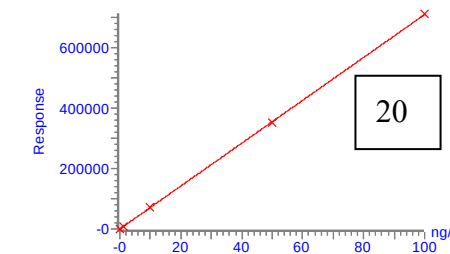
Compound name: ceftriaxone
Correlation coefficient: $r = 0.999933$, $r^2 = 0.999867$
Calibration curve: $20795 * x + -8.21786$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



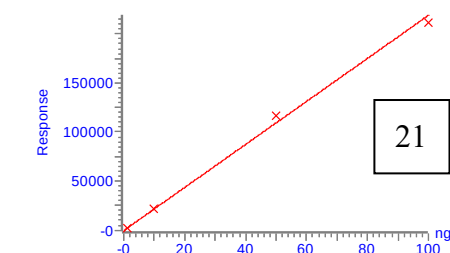
Compound name: cephalothin
Correlation coefficient: $r = 0.999971$, $r^2 = 0.999943$
Calibration curve: $1120.29 * x + 11.996$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



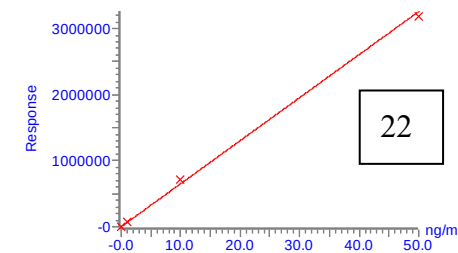
Compound name: cephadrine
Correlation coefficient: $r = 0.999966$, $r^2 = 0.999933$
Calibration curve: $7091.08 * x + -42.3251$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



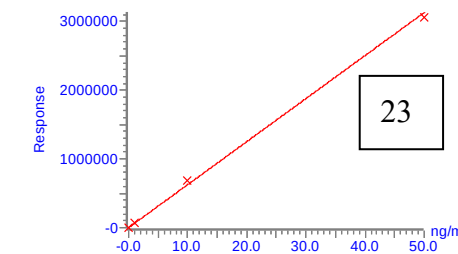
Compound name: Chlorotetracycline
Correlation coefficient: $r = 0.998666$, $r^2 = 0.997333$
Calibration curve: $2194.71 * x + -536.307$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: cimbuterol
Correlation coefficient: $r = 0.998830$, $r^2 = 0.997662$
Calibration curve: $65165.3 * x + -269.139$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: clenbuterol
Correlation coefficient: $r = 0.998816$, $r^2 = 0.997634$
Calibration curve: $62619.7 * x + -733.303$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: clenpenterol
Correlation coefficient: $r = 0.997773$, $r^2 = 0.995551$
Calibration curve: $245545 * x + -2928.48$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

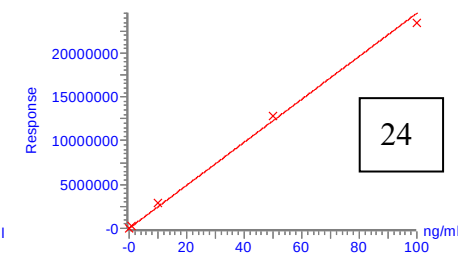
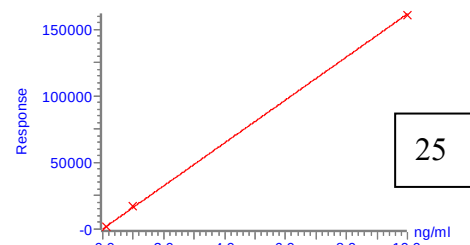
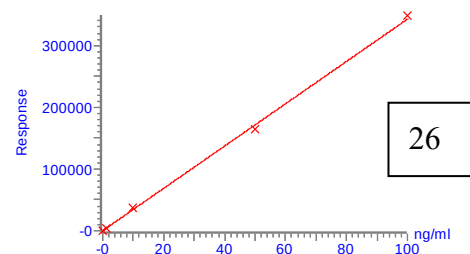


Figure 2(c) Calibration curve of 84 compounds found in DR-STD (Compound 25 ~ 36)

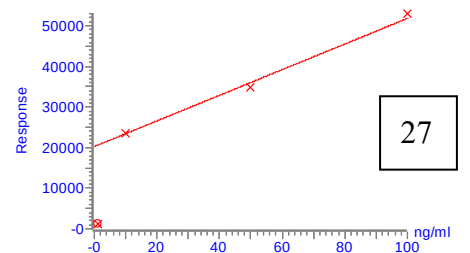
Compound name: clopidol
Correlation coefficient: $r = 0.999715$, $r^2 = 0.999430$
Calibration curve: $16132.7 * x + 157.162$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



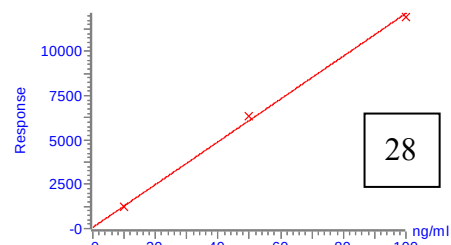
Compound name: cloxacillin
Correlation coefficient: $r = 0.999475$, $r^2 = 0.998950$
Calibration curve: $3426.87 * x + 78.9282$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



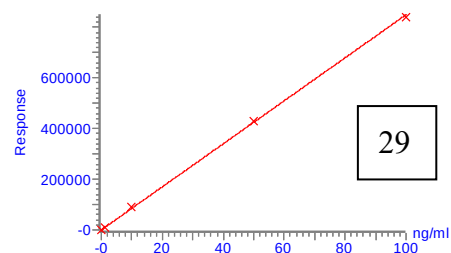
Compound name: decoquinat
Correlation coefficient: $r = 0.997209$, $r^2 = 0.994425$
Calibration curve: $315.784 * x + 20267$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



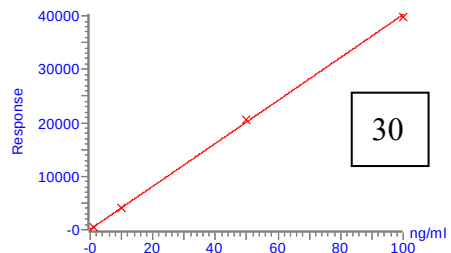
Compound name: desacetylcefapirin
Correlation coefficient: $r = 0.999461$, $r^2 = 0.998923$
Calibration curve: $120.707 * x + 65.0384$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



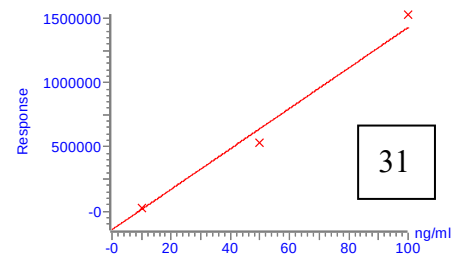
Compound name: dexamethasone
Correlation coefficient: $r = 0.999761$, $r^2 = 0.999522$
Calibration curve: $8492.78 * x + 39.8033$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



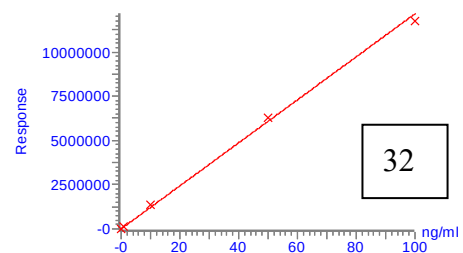
Compound name: dicloxacillin
Correlation coefficient: $r = 0.999902$, $r^2 = 0.999803$
Calibration curve: $401.61 * x + 87.0555$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



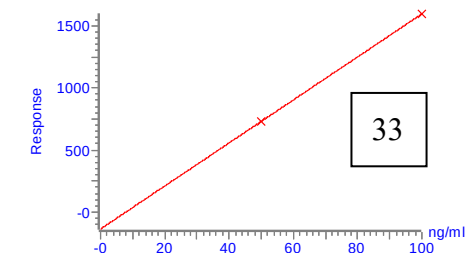
Compound name: difloxacin
Correlation coefficient: $r = 0.992039$, $r^2 = 0.984141$
Calibration curve: $15730.8 * x + -144342$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



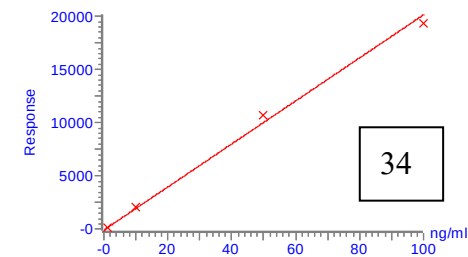
Compound name: dimetridazole
Correlation coefficient: $r = 0.998959$, $r^2 = 0.997920$
Calibration curve: $121527 * x + 683.835$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



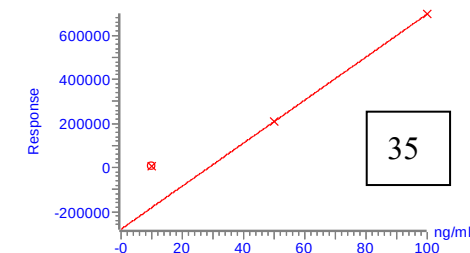
Compound name: doramectin
Correlation coefficient: $r = 1.000000$, $r^2 = 1.000000$
Calibration curve: $17.3144 * x + -136.063$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: doxycycline
Correlation coefficient: $r = 0.998481$, $r^2 = 0.996964$
Calibration curve: $202.059 * x + -71.4699$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: enrofloxacin
Correlation coefficient: $r = 1.000000$, $r^2 = 1.000000$
Calibration curve: $9762.17 * x + -279399$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: epi-testosterone
Correlation coefficient: $r = 0.999954$, $r^2 = 0.999908$
Calibration curve: $525.033 * x + -209.02$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

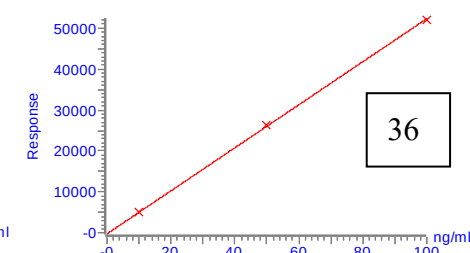
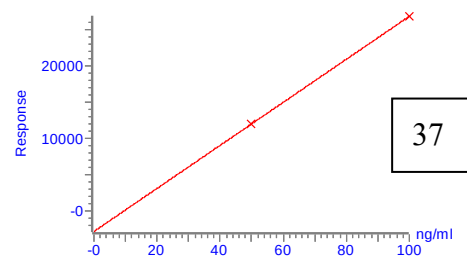
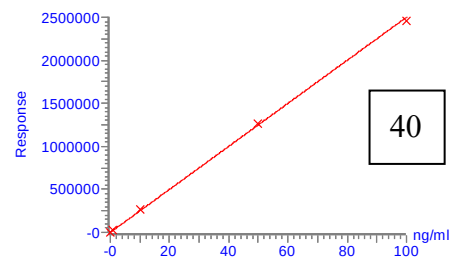


Figure 2(d) Calibration curve of 84 compounds found in DR-STD (Compound 37 ~ 48)

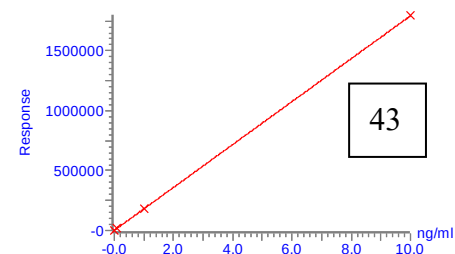
Compound name: eprinomectin
Correlation coefficient: $r = 1.000000$, $r^2 = 1.000000$
Calibration curve: $297.448 * x + -2834.03$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



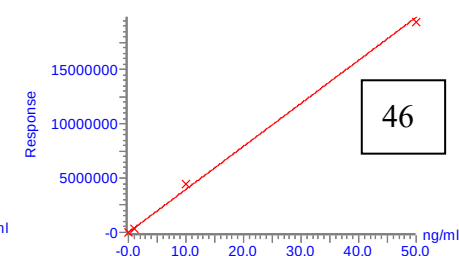
Compound name: hydroxy dimetridazole
Correlation coefficient: $r = 0.999746$, $r^2 = 0.999491$
Calibration curve: $25014.6 * x + 51.1015$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



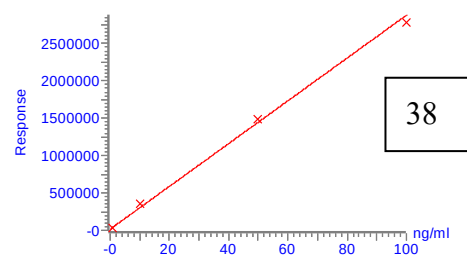
Compound name: lasalocid
Correlation coefficient: $r = 0.999919$, $r^2 = 0.999838$
Calibration curve: $179190 * x + 1012.47$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



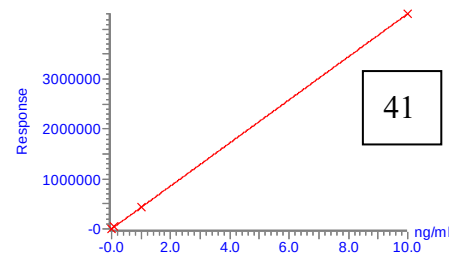
Compound name: mapenterol
Correlation coefficient: $r = 0.998167$, $r^2 = 0.996337$
Calibration curve: $396138 * x + -6570.97$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



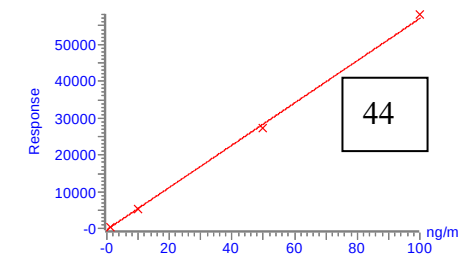
Compound name: flumequine
Correlation coefficient: $r = 0.997887$, $r^2 = 0.995779$
Calibration curve: $28622.2 * x + 15330$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



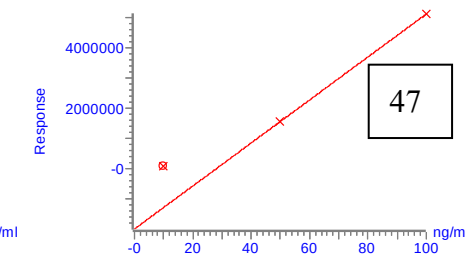
Compound name: ipronidazole
Correlation coefficient: $r = 0.999961$, $r^2 = 0.999921$
Calibration curve: $431053 * x + -982.628$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



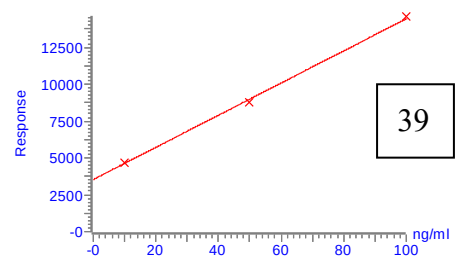
Compound name: mabuterol
Correlation coefficient: $r = 0.999650$, $r^2 = 0.999300$
Calibration curve: $572.001 * x + -184.937$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



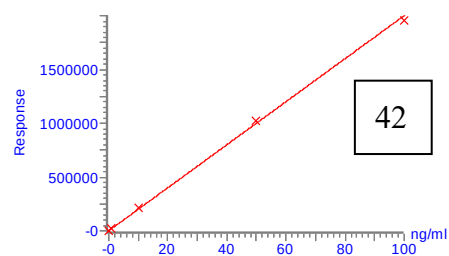
Compound name: marbofloxacin
Correlation coefficient: $r = 1.000000$, $r^2 = 1.000000$
Calibration curve: $71137.5 * x + -1.9976e+006$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



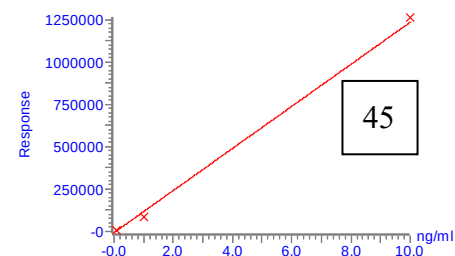
Compound name: furazolidone
Correlation coefficient: $r = 0.999573$, $r^2 = 0.999147$
Calibration curve: $109.03 * x + 3537.21$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: ipronidazole hydroxy
Correlation coefficient: $r = 0.999623$, $r^2 = 0.999245$
Calibration curve: $20020 * x + 121.929$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: maduramycin
Correlation coefficient: $r = 0.996580$, $r^2 = 0.993172$
Calibration curve: $124379 * x + -9673.17$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: metronidazole
Correlation coefficient: $r = 0.998455$, $r^2 = 0.996913$
Calibration curve: $73567.7 * x + 533.244$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

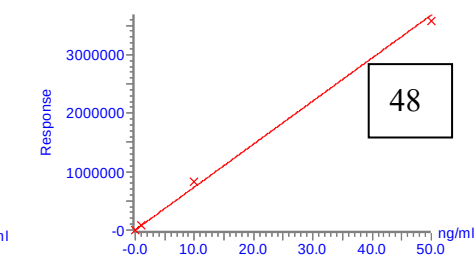
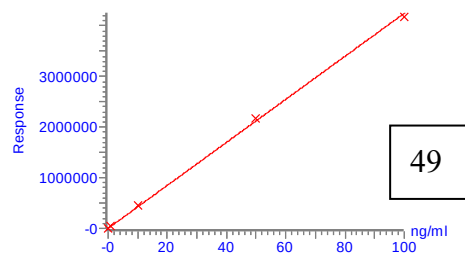
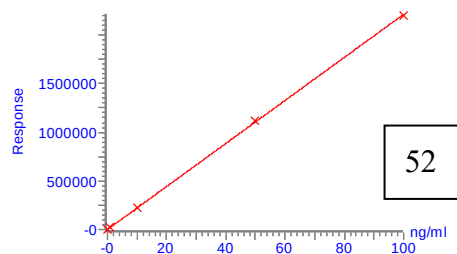


Figure 2(e) Calibration curve of 84 compounds found in DR-STD (Compound 49 ~ 60)

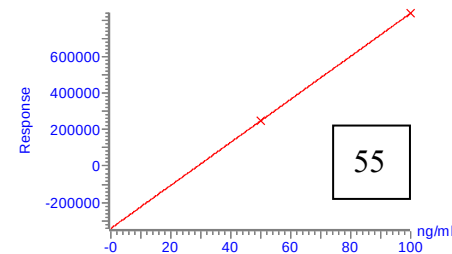
Compound name: metronidazole-hydroxy
Correlation coefficient: $r = 0.999735$, $r^2 = 0.999471$
Calibration curve: $42495.3 * x + 336.395$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



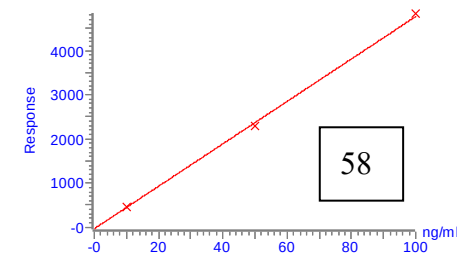
Compound name: nafcillin
Correlation coefficient: $r = 0.999956$, $r^2 = 0.999912$
Calibration curve: $22128.2 * x + 21.3705$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



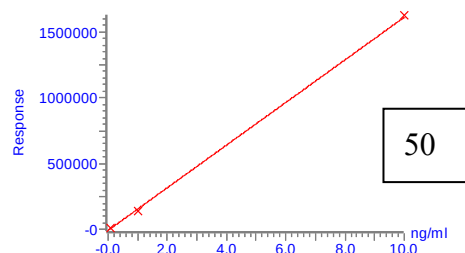
Compound name: norfloxacin
Correlation coefficient: $r = 1.000000$, $r^2 = 1.000000$
Calibration curve: $11840.4 * x + -342641$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



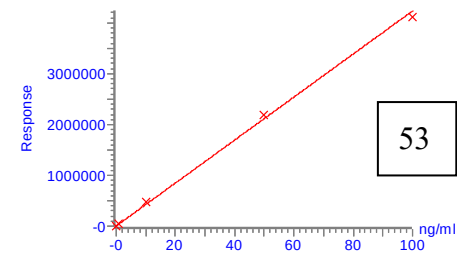
Compound name: oxbendazole
Correlation coefficient: $r = 0.999602$, $r^2 = 0.999203$
Calibration curve: $48.0087 * x + -33.7234$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



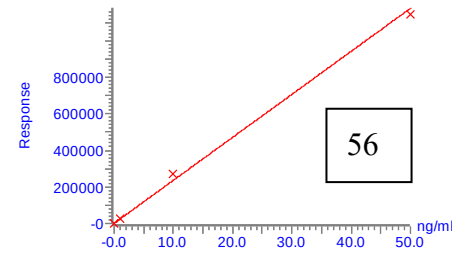
Compound name: monensin
Correlation coefficient: $r = 0.999452$, $r^2 = 0.998905$
Calibration curve: $161815 * x + -6233.4$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



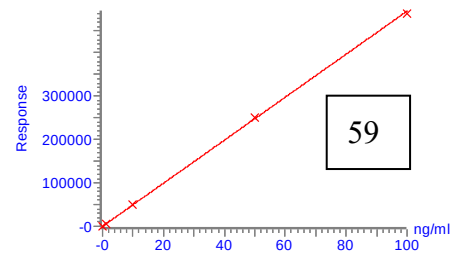
Compound name: nandrolone
Correlation coefficient: $r = 0.999144$, $r^2 = 0.998289$
Calibration curve: $42327.4 * x + 1210.03$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



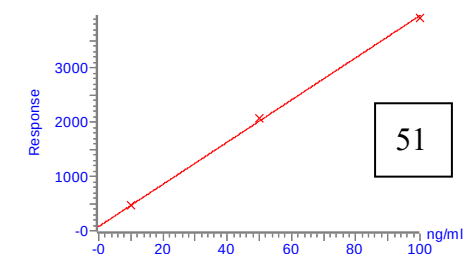
Compound name: novobiocin
Correlation coefficient: $r = 0.997991$, $r^2 = 0.995985$
Calibration curve: $23532.9 * x + 575.917$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



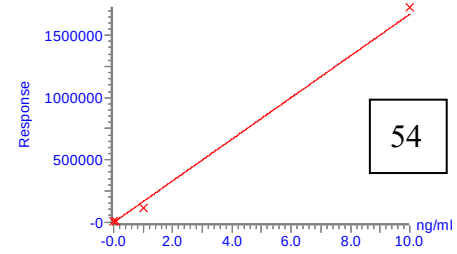
Compound name: penicillin G
Correlation coefficient: $r = 0.999917$, $r^2 = 0.999835$
Calibration curve: $4957.57 * x + 35.067$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



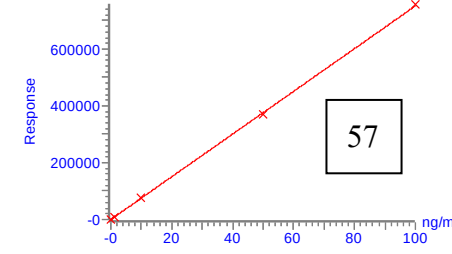
Compound name: monepantel sulfone
Correlation coefficient: $r = 0.999635$, $r^2 = 0.999269$
Calibration curve: $38.8976 * x + 75.3112$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: narasin
Correlation coefficient: $r = 0.994234$, $r^2 = 0.988502$
Calibration curve: $167377 * x + -4155.44$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: oxacillin
Correlation coefficient: $r = 0.999901$, $r^2 = 0.999803$
Calibration curve: $7517.31 * x + -8.04572$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: penicillin V
Correlation coefficient: $r = 0.999962$, $r^2 = 0.999924$
Calibration curve: $3613.33 * x + -33.0531$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

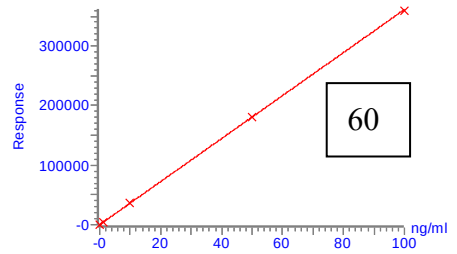
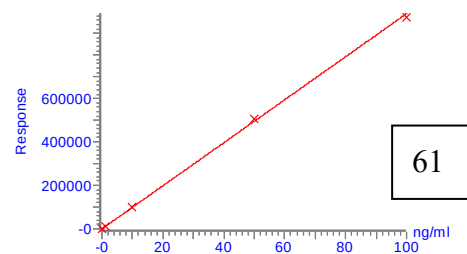
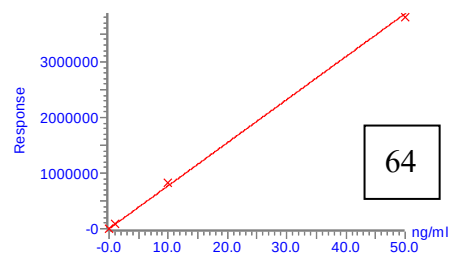


Figure 2(f) Calibration curve of 84 compounds found in DR-STD (Compound 61 ~ 72)

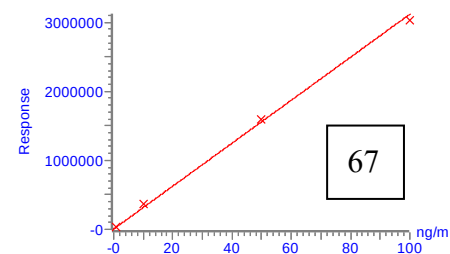
Compound name: prednisolone
Correlation coefficient: $r = 0.999829$, $r^2 = 0.999657$
Calibration curve: $9899.37 * x + 51.1685$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



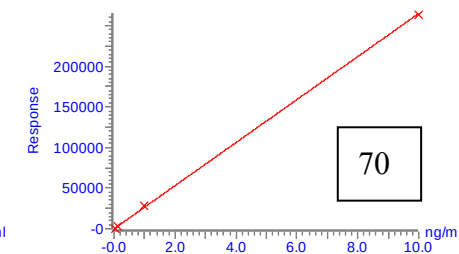
Compound name: ronidazole
Correlation coefficient: $r = 0.999296$, $r^2 = 0.998592$
Calibration curve: $77329 * x + 303.536$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



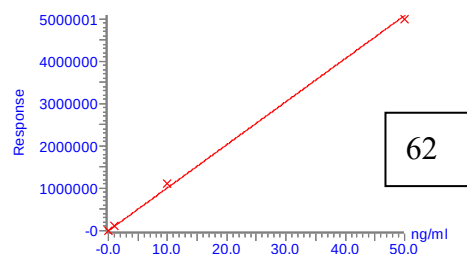
Compound name: stanozolol
Correlation coefficient: $r = 0.998260$, $r^2 = 0.996523$
Calibration curve: $31110.1 * x + 4308.99$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



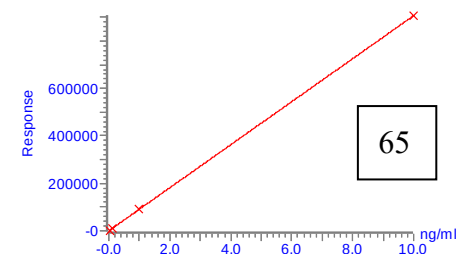
Compound name: terbutaline
Correlation coefficient: $r = 0.999821$, $r^2 = 0.999642$
Calibration curve: $26487.7 * x + -24.567$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



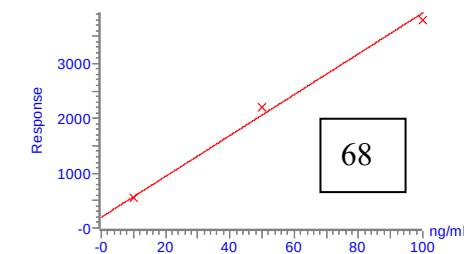
Compound name: ractopamine
Correlation coefficient: $r = 0.999110$, $r^2 = 0.998221$
Calibration curve: $101602 * x + -387.788$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



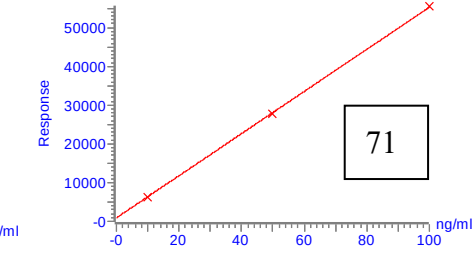
Compound name: salbutamol
Correlation coefficient: $r = 0.999992$, $r^2 = 0.999984$
Calibration curve: $90739.5 * x + -487.432$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



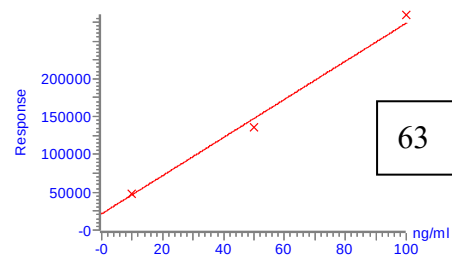
Compound name: sulfadimethoxine/sulfadoxine
Correlation coefficient: $r = 0.997373$, $r^2 = 0.994752$
Calibration curve: $37.2585 * x + 196.251$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



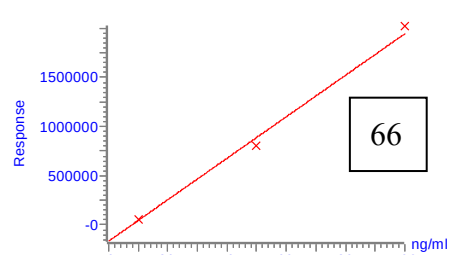
Compound name: thiabendazole
Correlation coefficient: $r = 0.999958$, $r^2 = 0.999916$
Calibration curve: $543.638 * x + 900.933$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



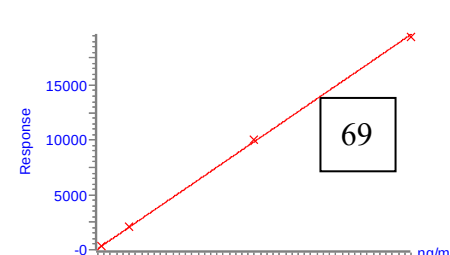
Compound name: robenidin
Correlation coefficient: $r = 0.996263$, $r^2 = 0.992539$
Calibration curve: $2521.53 * x + 21448.7$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: sarafloxacin
Correlation coefficient: $r = 0.997241$, $r^2 = 0.994491$
Calibration curve: $21102.7 * x + -166509$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: sulfanilamide
Correlation coefficient: $r = 0.999884$, $r^2 = 0.999769$
Calibration curve: $195.305 * x + 96.1512$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: tildipirosin
Correlation coefficient: $r = 0.995640$, $r^2 = 0.991298$
Calibration curve: $5.03956 * x + 89.8912$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

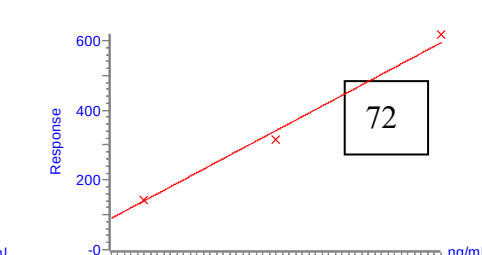
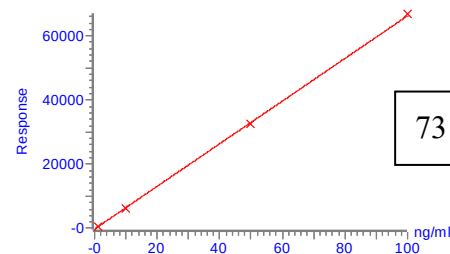
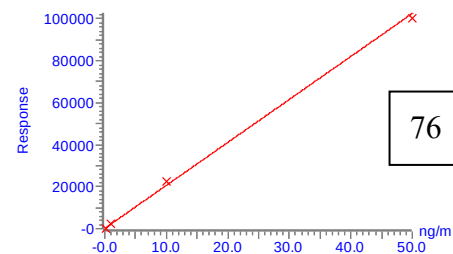


Figure 2(q) Calibration curve of 84 compounds found in DR-STD (Compound 73 ~ 84)

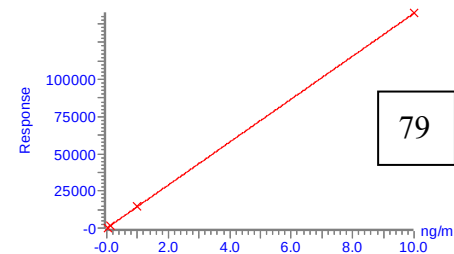
Compound name: vancomycin
Correlation coefficient: $r = 0.999921$, $r^2 = 0.999843$
Calibration curve: $664.406 * x + -202.604$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



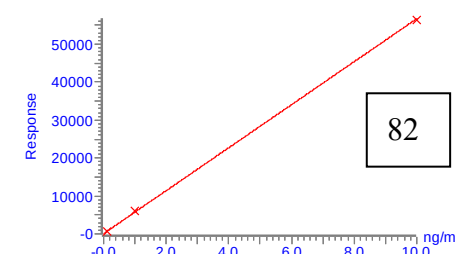
Compound name: 17-alpha-ethynylestradiol
Correlation coefficient: $r = 0.998766$, $r^2 = 0.997533$
Calibration curve: $2049.03 * x + 96.5943$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



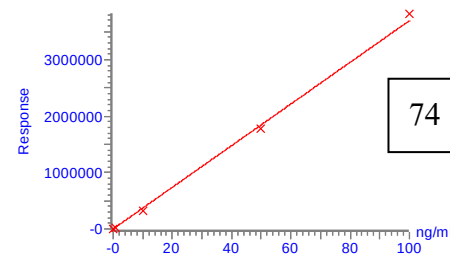
Compound name: diethylstilbesterol
Correlation coefficient: $r = 0.999912$, $r^2 = 0.999825$
Calibration curve: $14468.9 * x + -36.4843$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



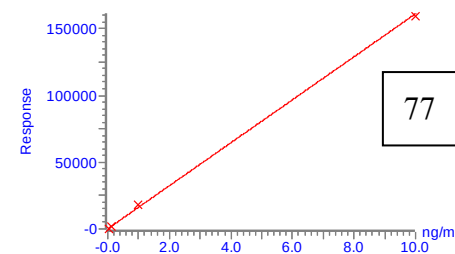
Compound name: estriol
Correlation coefficient: $r = 0.999875$, $r^2 = 0.999750$
Calibration curve: $5663.24 * x + 63.3452$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



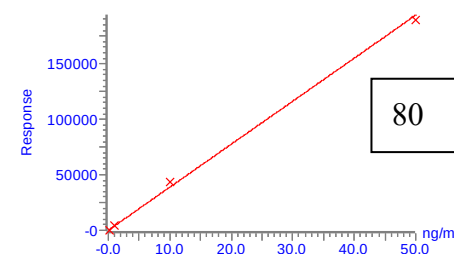
Compound name: Virginiamycin
Correlation coefficient: $r = 0.998677$, $r^2 = 0.997356$
Calibration curve: $36943.3 * x + -1991.88$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



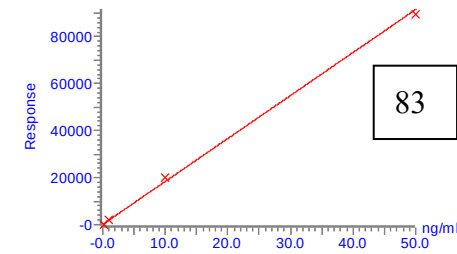
Compound name: betamethasone
Correlation coefficient: $r = 0.999379$, $r^2 = 0.998759$
Calibration curve: $16100 * x + 128.795$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



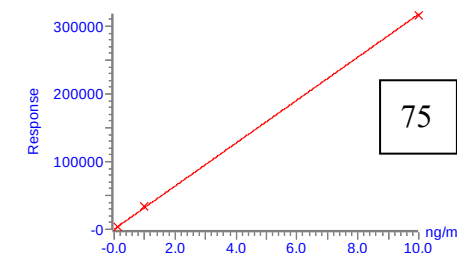
Compound name: estradiol
Correlation coefficient: $r = 0.998567$, $r^2 = 0.997136$
Calibration curve: $3872.98 * x + 123.636$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



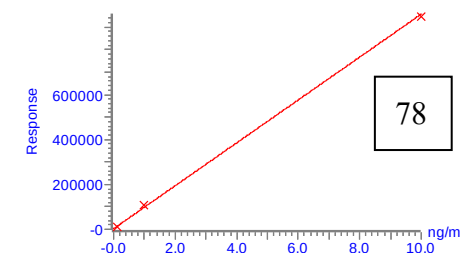
Compound name: ethyl estradiol
Correlation coefficient: $r = 0.998867$, $r^2 = 0.997736$
Calibration curve: $1828.98 * x + 99.5503$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



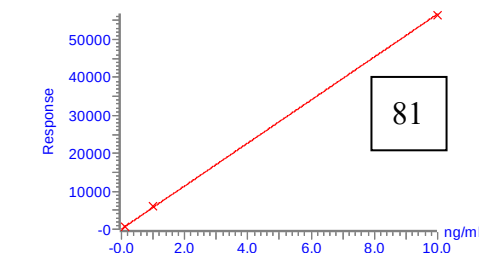
Compound name: zilpaterol
Correlation coefficient: $r = 0.999886$, $r^2 = 0.999773$
Calibration curve: $31753.4 * x + 329.518$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



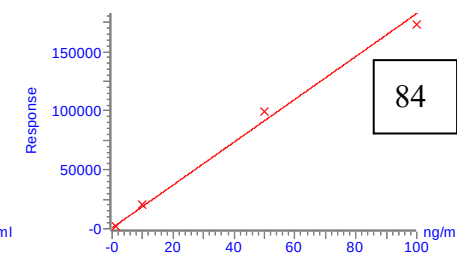
Compound name: diclazuril
Correlation coefficient: $r = 0.999137$, $r^2 = 0.998274$
Calibration curve: $95537.3 * x + 2591.45$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: estriol
Correlation coefficient: $r = 0.999875$, $r^2 = 0.999750$
Calibration curve: $5663.24 * x + 63.3452$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Compound name: nicarbazin
Correlation coefficient: $r = 0.997513$, $r^2 = 0.995031$
Calibration curve: $1816.66 * x + 690.232$
Response type: External Std, Area
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



3.3 Screening and Quantitation result for DR-BLK A, DR-BLK B, DR-SPK A and DR-SPK B using established MRM method and calibration curves

Sample DR-BLK A, DR-BLK B, DR-SPK A and DR-SPK B were diluted with water (1:1, vol:vol) before LCMSMS injection. Triplicate analysis was performed on each sample to obtain reliable results. For each detected analyte in the sample, they were quantitated based on the calibration curve established with the standards.

3.3.1 Results for DR-BLK A, DR-BLK B

DR-BLK A and DR-BLK B are blank matrices provided. There are traces of drug residue detected in both blank matrices. 5 analytes were detected and quantitated in DR-BLK A while 4 analytes were detected and quantitated in DR-BLK B. **Table 5** shows the drug residue detected and the amount present in the blank matrices. **Figure 3** display the MRM chromatogram of detected analytes in DR-BLK A and **Figure 4** display the MRM chromatogram of detected analytes in DR-BLK B

Table 5. List of detected compounds in DR-BLK A and DR-BLK B

No	Compounds	Conc (ppb)	
		DR-BLK A	DR-BLK B
1	Albendazole	130.1	49.4
2	Altrenogest	0.1	
3	Furazolidone	428.1	363.1
4	Monensin	0.1	
5	Sulfanilamide	79.1	78.5
6	17-alpha-ethynylestradiol		0.3

Figure 3 MRM chromatograms of detected compounds in DR-BLK A

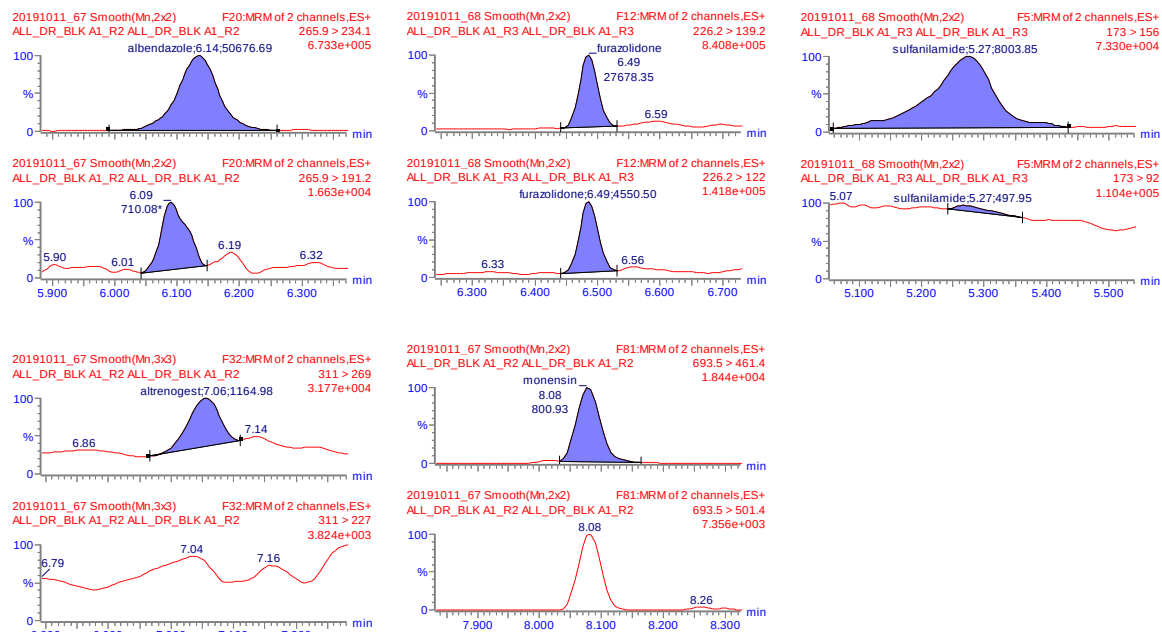
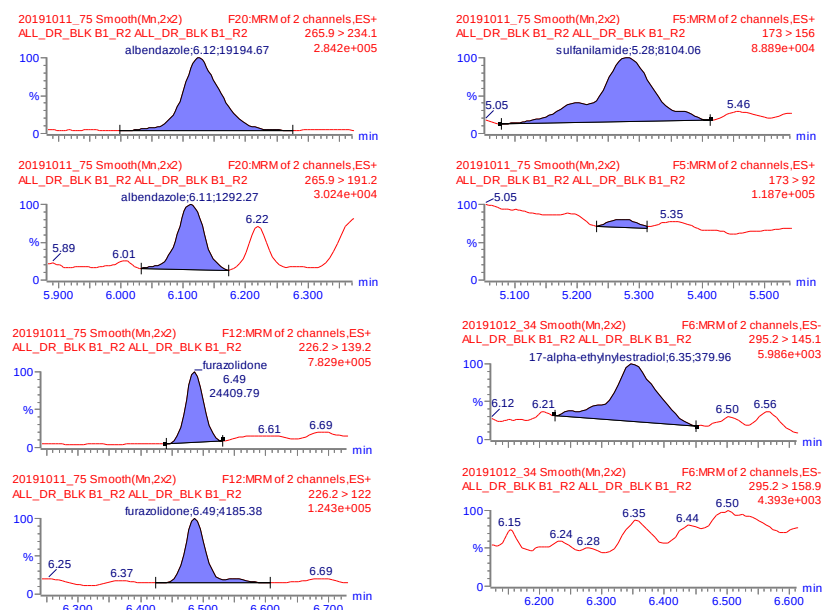


Figure 4 MRM chromatograms of detected compounds in DR-BLK B



3.3.2 Results for DR-SPK A, DR-SPK B

DR-SPK A and DR-SPK B are spiked samples that was provided. A total of 32 analytes were detected in DR-SPK A and 30 analytes were detected in DR-SPK B. Due to the interference from the matrices, fronting and tailing are observed for some of the analytes.

Table 6 list down the drug residues detected and the amount present in the spiked matrices.

Figure 5 display the MRM chromatogram of detected analytes in DR-SPK A and **Figure 6** display the MRM chromatogram of detected analytes in DR-SPK B

Table 6. List of detected compounds and its amount in DR-SPK A and DR-SPK B

No	Compounds	Conc (ppb)	
		DR-SPK A	DR-SPK B
1	16-beta-hydroxy stanozolol	3.02	2.67
2	4-epioxytetracycline	2.07	3.00
3	Albendazole	309.19	58.22
4	Altrenogest	0.08	
5	Amoxicillin	0.51	1.03
6	Ampicillin	0.80	1.62
7	Chlortetracycline	21.63	39.45
8	Clenbuterol	0.22	0.22
9	Dexamethasone	6.78	6.74
10	Dimetridazole	0.92	0.68
11	Epi-testosterone/Testosterone		13.91
12	Furazolidone	752.13	773.79
13	Hydoxy dimetridazole	0.35	0.35
14	Ipronidazole	1.22	1.20
15	Maduramycin	2.51	3.75
16	Metronidazole	0.34	0.28
17	Metronidazole-hydroxy	0.28	0.28
18	Monensin	4.89	5.35
19	Nandrolone	2.28	2.10
20	Novobiocin	8.65	8.48
21	Oxibendazole	23.56	
22	Penicillin V	25.94	28.15
23	Prednisolone	6.48	8.42
24	Ractopamine	0.14	0.16
25	Salbutamol	0.12	0.12
26	Stanozolol	2.72	1.72
27	Sulfanilamide	84.70	67.87
28	Zilpaterol	0.12	0.010
29	17-alpha-ethynylestradiol	1.08	0.30
30	betamethasone	2.72	0.68
31	Diethylstilbesterol	1.06	0.30
32	Estrone	0.06	
33	Ethyl estradiol	1.04	0.24

Figure 5(a) MRM chromatograms of detected compounds in DR-SPK A

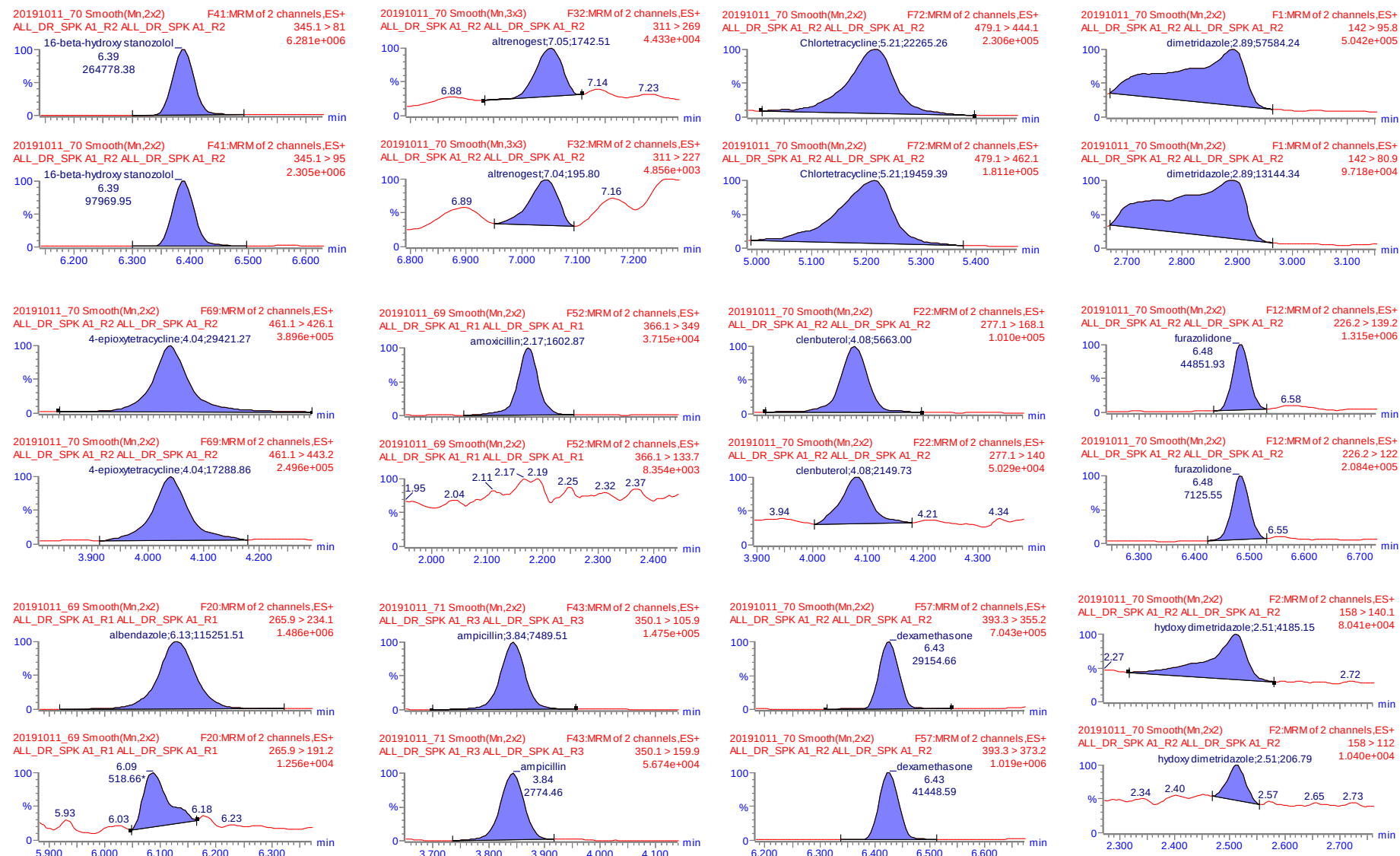


Figure 5(b) MRM chromatograms of detected compounds in DR-SPK A

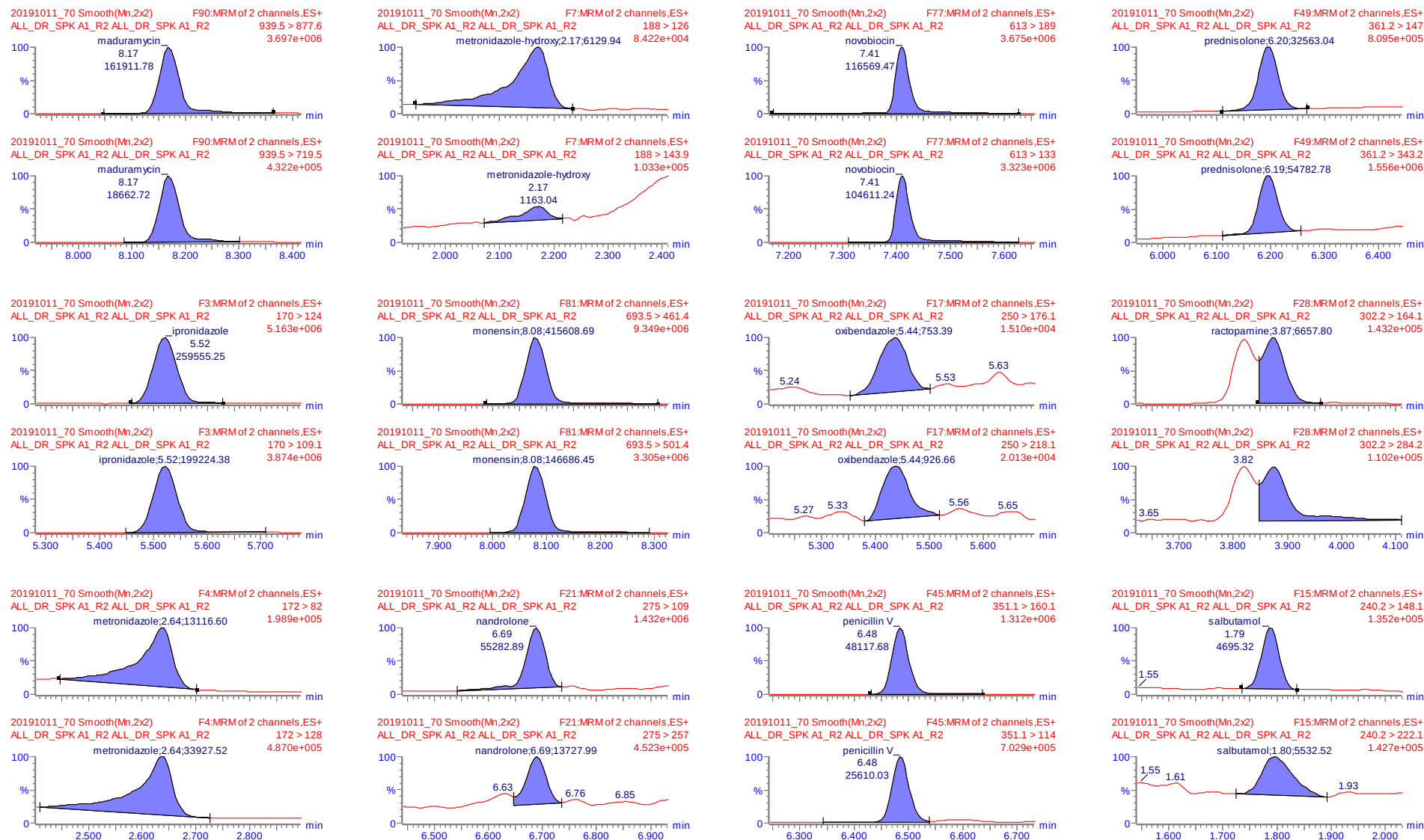


Figure 5(c) MRM chromatograms of detected compounds in DR-SPK A

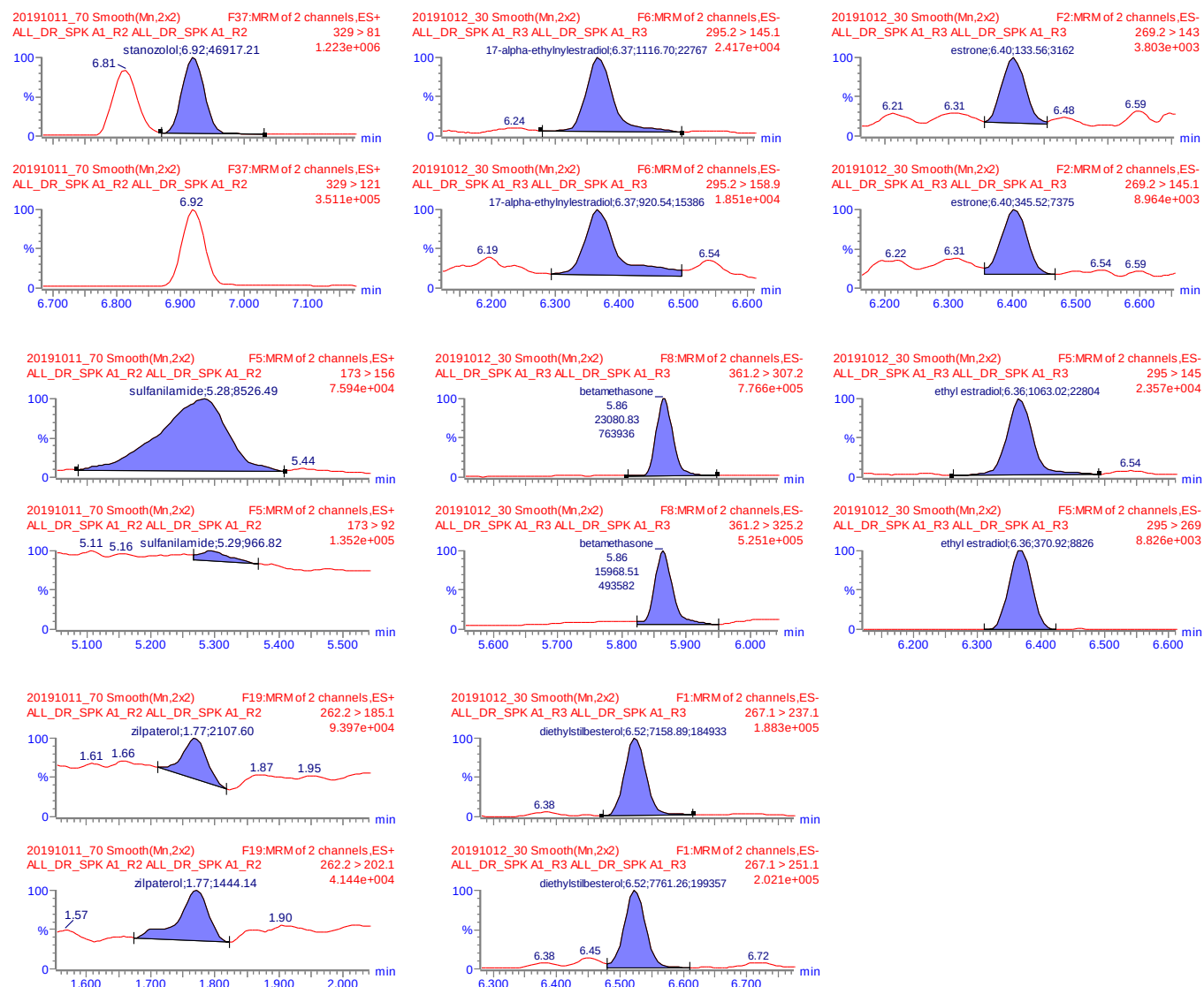


Figure 6(a) MRM chromatograms of detected compounds in DR-SPK B

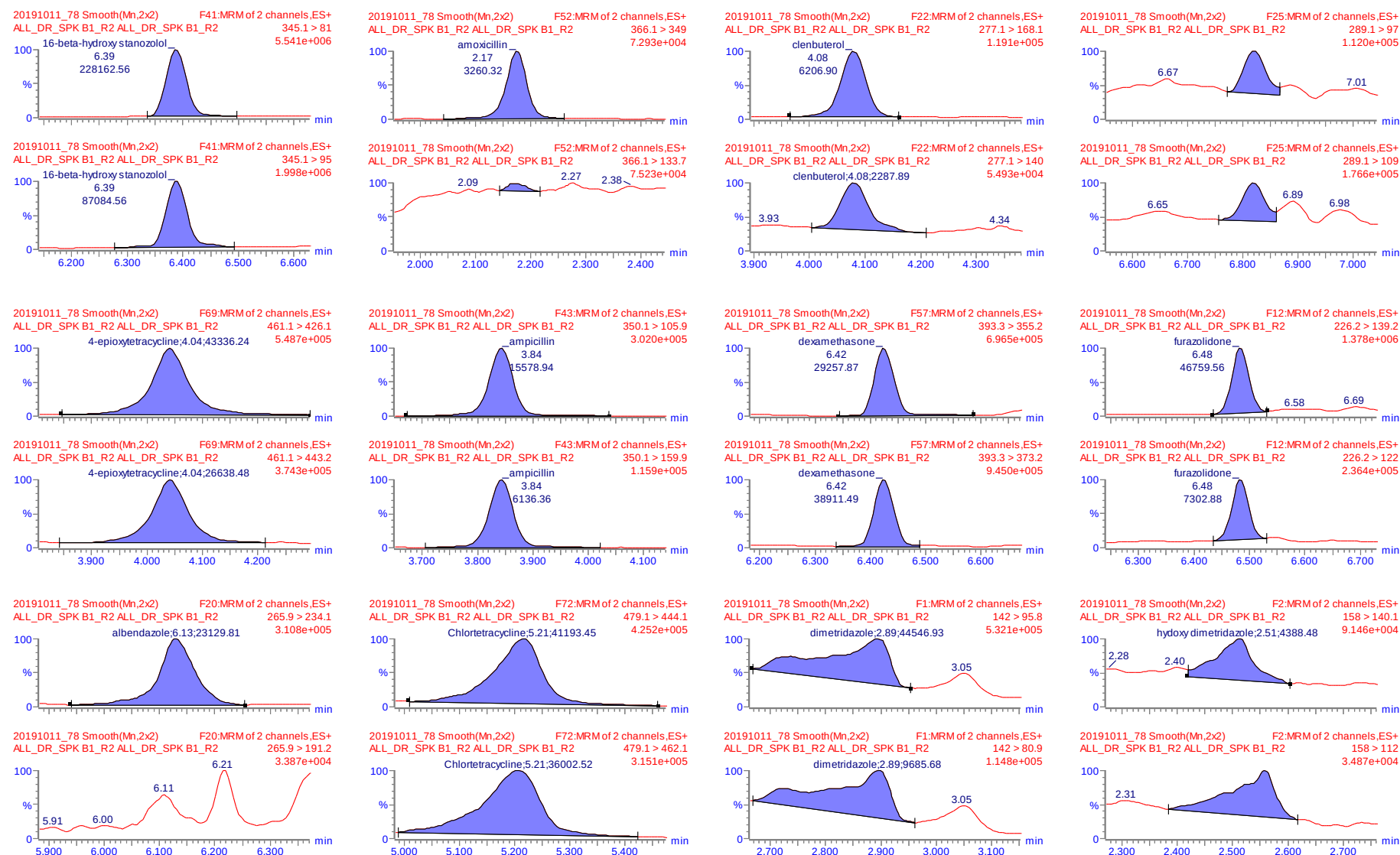


Figure 6(b) MRM chromatograms of detected compounds in DR-SPK B

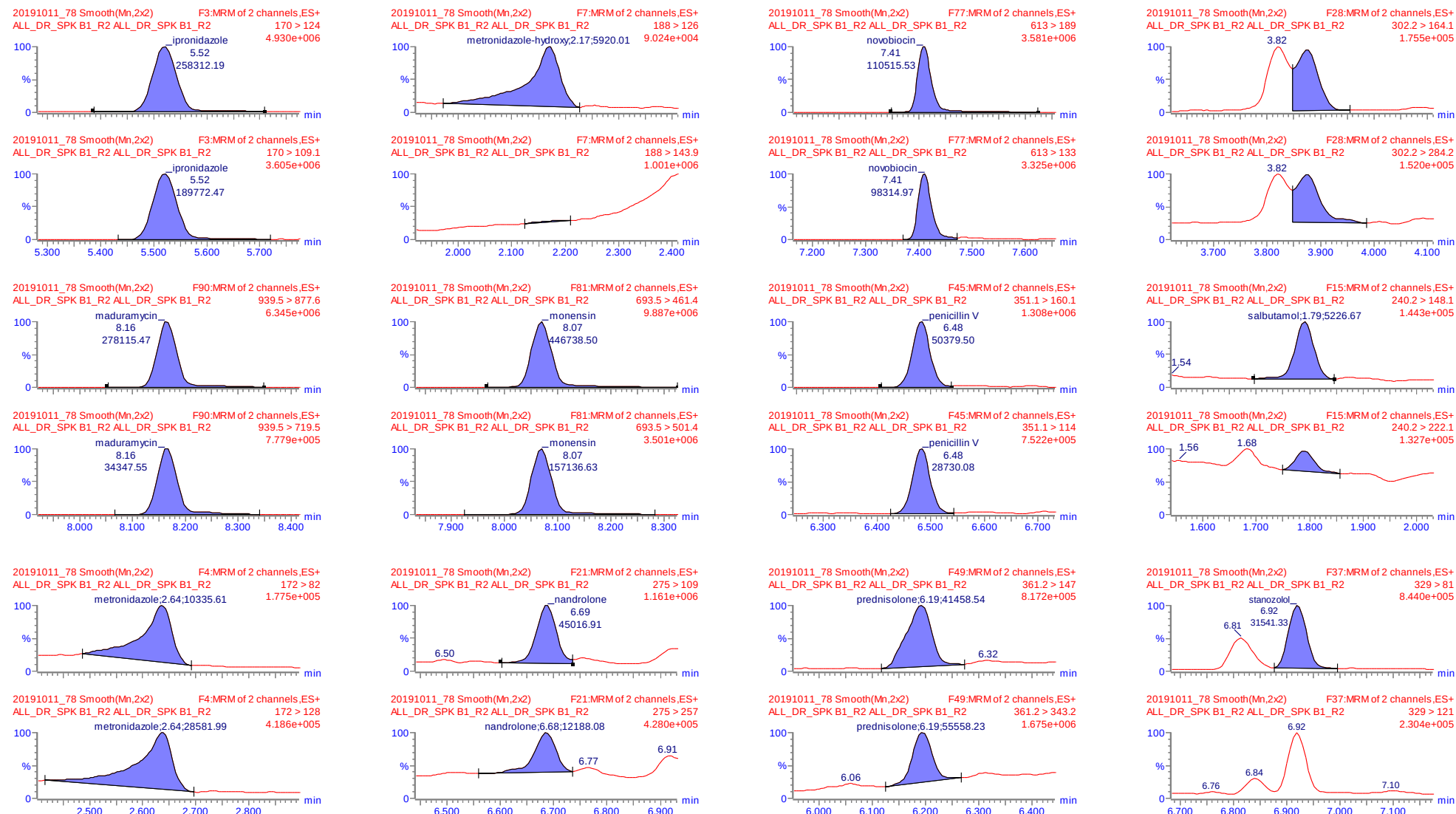
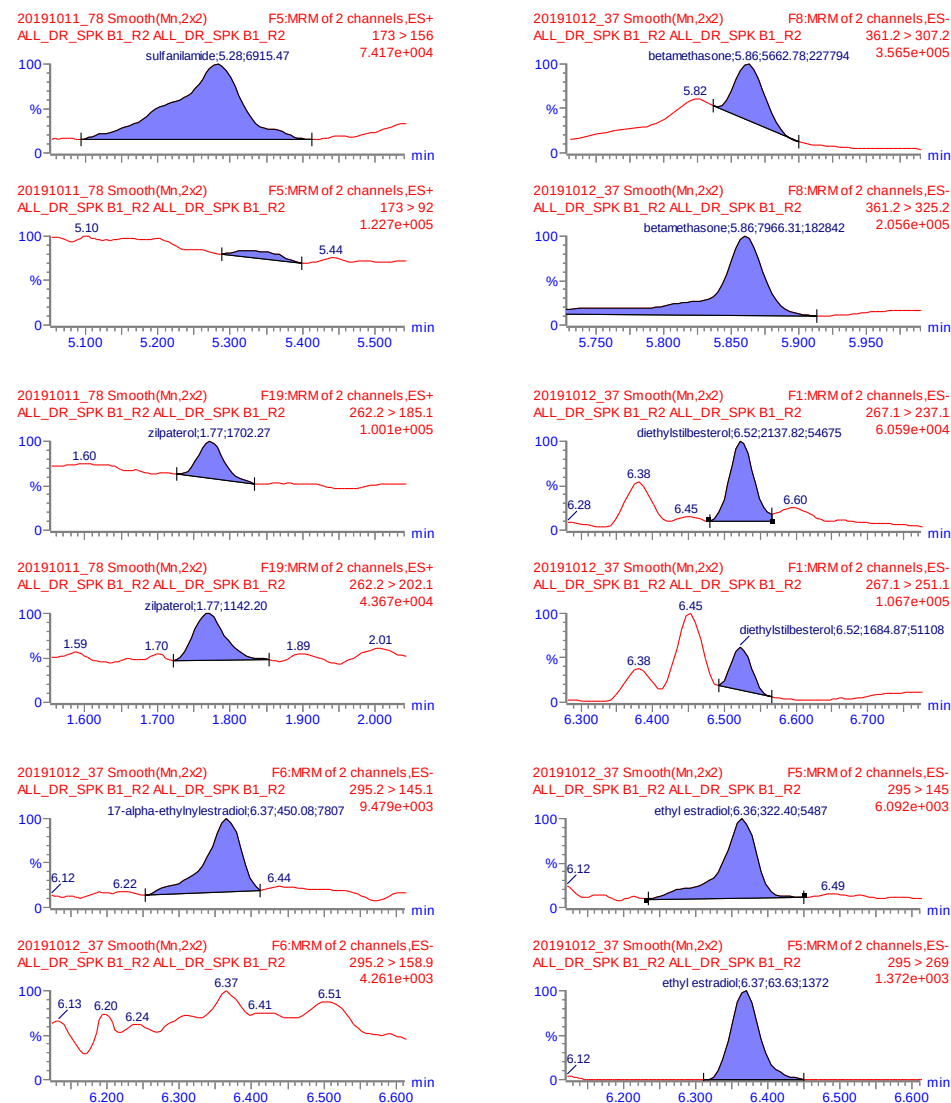


Figure 6(c) MRM chromatograms of detected compounds in DR-SPK B



4 Conclusions

- Standard DR-STD was screened using an MRM method that was established using Quanpedia. Out of the 250 potential compounds, 84 compounds were identified
- Calibration curves were established for all the detected analytes to further screen and quantitate for samples DR-BLK A, DR-BLK B, DR-SPK A and DR-SPK B. All calibration curves achieve good linearity of >0.995 .
- Triplicate analysis of the samples was performed. Total number of compounds identified in the samples are summarized as follow:
 - a. DR-SPK A: 32 drugs identified
 - b. DR-SPK B: 30 drugs identified
 - c. DR-BLK A: 5 drugs identified
 - d. DR-BLK B: 4 drugs identified

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