SHIMADZU APPLICATION NEWS

LA146-E015

● GASCHROMATOGRAPHY MASS SPECTROMETRY

No.M192

Analysis of Pesticide Residues in Foods Using GC/MS

In Japan, various pesticides are produced and used, and they are strictly regulated by law. For example, the Drinking Water Test Method regulates 19 substances (4 substances were recently added). Pesticides residues in food products are regulated by the Food Sanitation Law. In the official gazette issued on August 14, 1995, 108 pesticides were regulated. Subsequently, 30 pesticides were added on September 2, 1996, 23 pesticides on September 1, 1997, 18 substances on October 12, 1998, and 20 pesticides on November 22, 1999. In 1999, 199 pesticides were regulated.

Below, regulated pesticides which can be analyzed by GC/MS or GC were analyzed using GC/MS. Table 1 shows the analytical conditions and Table 2 shows the list of 47 target pesticides. Fig. 1 shows the TIC for the 47 pesticides and Fig. 2 through 5 show the SIM chromatograms. Concentrations were 1 ppm for all pesticides.

Table 1 Analytical conditions

-GC-

Column	: DB-1 30m × 0.25mm I.D. df=0.25μm
Column Temp.	: 50˚C(1min)- 20˚C/min - 120˚C - 5˚C/min - 300˚C(1.5min)
Injector. Temp.	: 300˚C
Interface. Temp.	: 300˚C
Carrier Gas	: He 250kPa(1min)-100kPa(2min)- 3kPa/min - 220kPa
	: Splitless (2min)

-MS-

Scan Range	: m/z 35 → 550
SIM	: 0.2sec

Table 2 List of pesticides

Peak NO.	Compound	SIM			Peak NO.	Compound	SIM	
1	DCIP	121.05	77.05	123.05	28	Lenacil	153.15	234.20
2	EPTC	128.20	189.10		29	Thenylchlor	288.25	127.15
3	Butylate	156.20	217.10		30	Acetamiprid	152.15	221.00
4	Cadusafos	159.00	270.25		31	Tebuconazole	250.15	125.10
5	Trifluralin	306.10	264.05		32	Pyributicarb	181.15	165.15
6	Thiometon	125.05	88.10	246.20	33	Bifenthrin	181.20	166.20
7	Nitenpyram	236.05	169.05		34	Tebufenpyrad	333.30	318.25
8	Tefluthrin	197.10	177.10		35	Furametpyr	298.30	157.10
9	Dimethenamid	230.10	154.15		36	Pyriproxyfen	136.20	226.20
10	Tolclofos-methyl	265.05	267.05		37	Cyhalofop-butyl	357.30	256.20
11	Alachlor	188.15	160.20		38	Fenarimol	330.10	139.10
12	Dimethylvinphos(E)	295.05	297.05		39	Pyraclofos	360.05	194.10
13	Pirimiphos-methyl	305.20	290.20		40	Acrinathrin	181.15	289.10
14	Dimethylvinphos(Z)	295.05	297.05		41	Pyridaben	147.20	364.10
15	Metolachlor	238.15	162.20		42	Cafenstrole	100.15	188.20
16	Fosthiazate	195.15	283.00		43	Cyfluthrin	163.15	226.00
17	Fosthiazate	195.15	283.00		44	Cyfluthrin	163.15	226.00
18	Isofenphos	213.15	255.10		45	Cyfluthrin	163.15	266.00
19	Paclobutrazol	236.15	125.10		46	Cyfluthrin	163.15	266.00
20	Tricyclazole	189.10	162.10		47	Halfenprox	265.10	183.10
21	Fludioxonil	248.15	182.05		48	Pyrimidifen	184.15	377.00
22	Butamifos	286.20	200.15		49	Fenvalerate	125.10	418.95
23	Myclobutanil	179.10	288.15		50	Fenvalerate	125.10	418.95
24	Difenzoquat	234.20	189.10		51	Difenoconazole	323.15	265.10
25	Flusilazole	233.15	315.15		52	Difenoconazole	323.15	265.10
26	Cyproconazole	222.10	139.10		53	Imibenconazole	375.20	125.05
27	Chlorfenapyr	59.10	247.00					

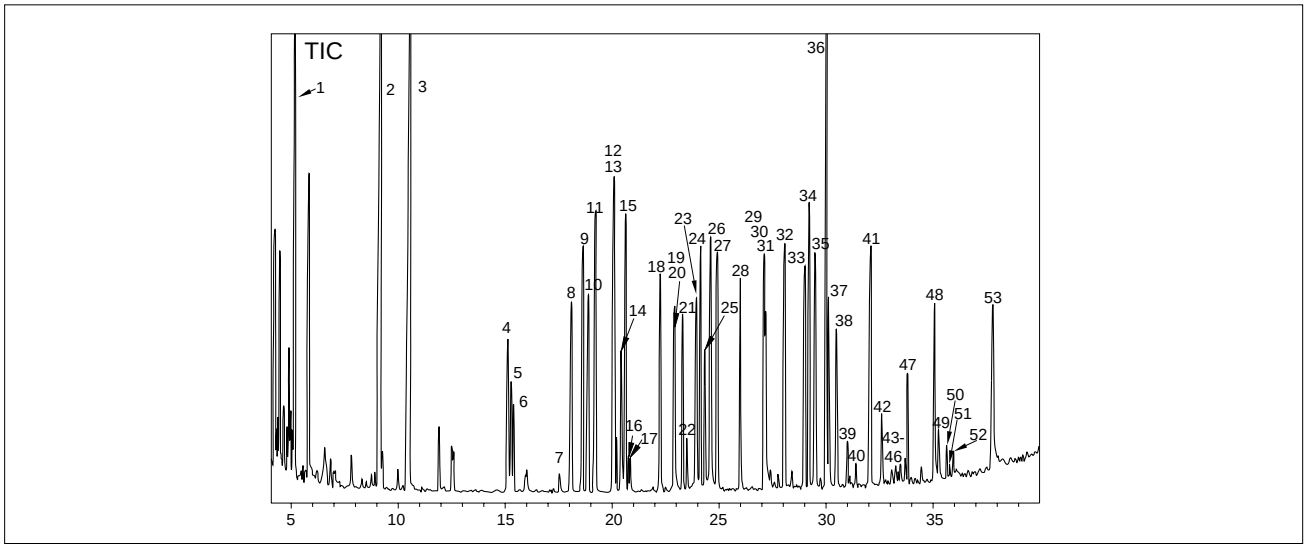

Fig. 1 TIC of pesticides

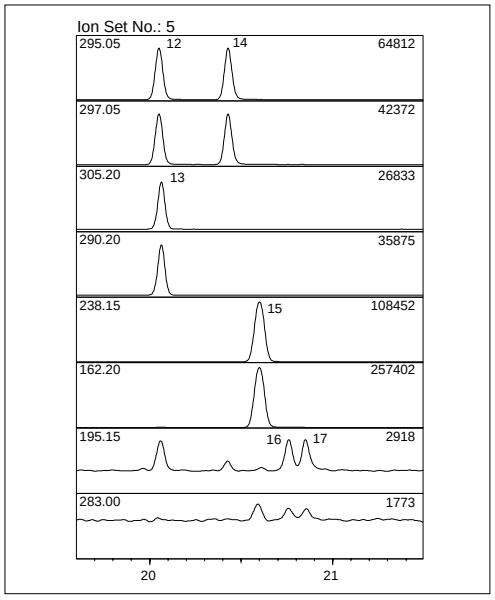

Fig. 2 SIM Chromatograms of Pesticides (Ion Set: 5)

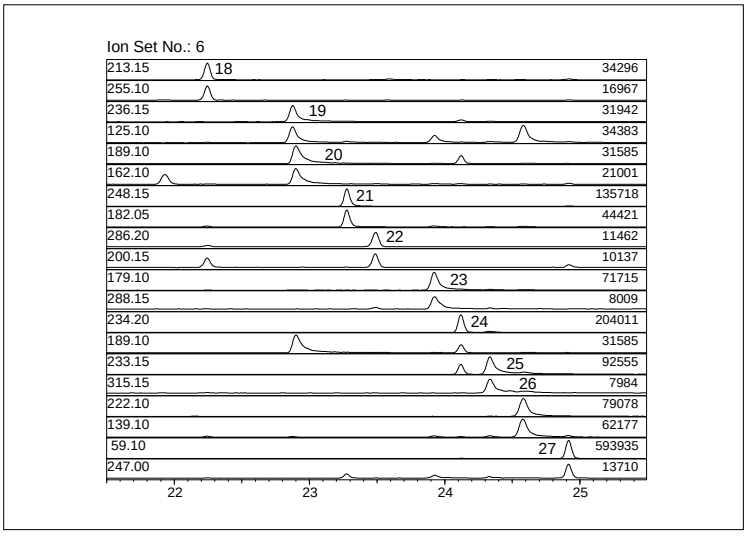

Fig. 3 SIM Chromatograms of Pesticides (Ion Set: 6)

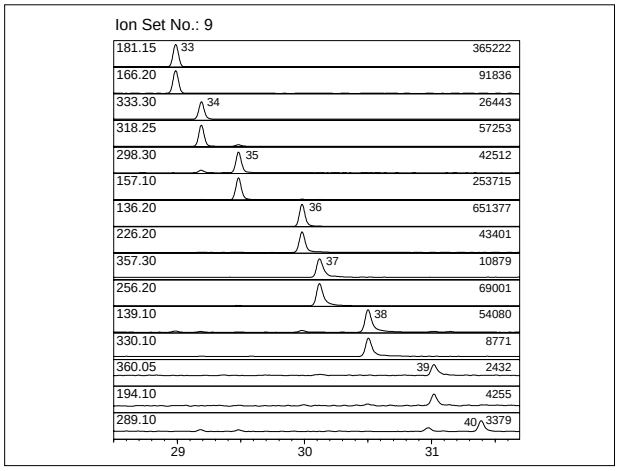

Fig. 4 SIM Chromatograms of Pesticides (Ion Set: 9)

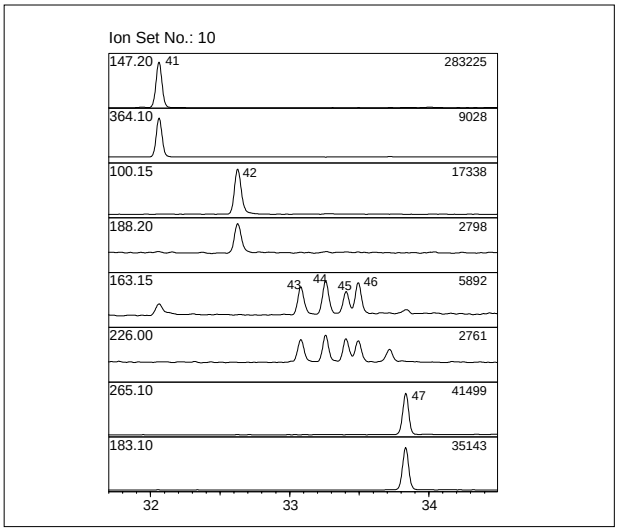

Fig. 5 SIM Chromatograms of Pesticides (Ion Set: 10)

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