

5.3 Balance: sensibility reciprocal is 0.1 mg and 0.01 g.

5.4 Homogenizer.

5.5 Shaker.

5.6 Nitrogen evaporator.

6 Procedure

6.1 Extraction and Clean-up

A 10 g finely shattered sub-sample was placed in a polypropylene centrifuge tube (100 mL) and 6.0 g magnesium sulfate anhydrous, 1.5 g sodium acetate anhydrous were added. 20 mL acetonitrile (comprising 0.1% acetic acid) was then added to the centrifuge tube and homogenized for 2 min. After which, the sample was centrifuged at 10,000 rpm for 10 min. The supernatant was evaporated to almost dry by a rotary vacuum evaporator under 40 °C, and completely dried up by blowing nitrogen. Residues were dissolved into 2 mL acetonitrile. The solution then transferred to another centrifuge tube which containing 200 mg C18, 150 mg PSA. The mixture was vortexed for 2 min, followed by centrifugation at 5,000 rpm for 3 min. The supernatant was taken with a syringe and filtrated through a 0.45 μm membrane prior to its injection into the GC-MS system.

6.2 Determination

6.2.1 GC-MS operating conditions

GC-MS operating conditions is as following:

- a) Column: RTX-5MS (30 m × 0.25 mm × 0.25 μm) capillary column¹⁾ or equivalent;
- b) Oven temperature: start at 50 °C (hold 2 min), 50 °C ~ 170 °C at 25 °C/min, 170 °C ~ 230 °C at 2 °C/min, 230 °C ~ 280 °C at 10 °C/min (hold 8 min);
- c) Injection volume: 1 μL;
- d) Carrier gas: helium, purity ≥ 99.999%, flow rate: 1.0 mL/min;
- e) Injection temperature: 270 °C;

1) RTX-5MS quartz capillary column is the commercial name which provided by the RTX company. This information only mentioned here for the convenient usage of this standard, and is not a recommendation or endorsement of the product. Other products can be used as well if they have similar effects.

- f) Injection mode: splitless;
- g) NCI source temperature: 200 °C ; Reaction gas: methane, purity $\geq 99.999\%$, flow rate: 2.0 mL/min;
- h) Interface temperature: 250 °C ;
- i) Operation method: One quantitative ion and 1-3 qualitative ions of each pesticide were analyzed by ion monitor mode. Retention time, quantitative ion and qualitative ion were shown in annex B. The beginning, stopping time and dwell time of every selected ions can be found in annex C.

6.2.2 Qualitative determination

If the retention time of target peak was within $\pm 0.5\%$ deviation of standard, and the deviation of ion abundance ratio between sample and standard was no more than the ranges shown in table 1, the pesticide can be determined exist.

Table1 Maximum permitted tolerances for relative ion intensities while confirmation

Relative intensity/%	>50	>20~50	>10~20	≤ 10
Permitted tolerances/%	± 20	± 25	± 30	± 50

6.2.3 Quantitative determination

To reduce the influence of matrix, we use negative matrix solution to make the matrix mix standard working solution and use external standard to quantify. The response of pesticide in the sample must within the linear range of the matrix mix standard working solution. The GC-MS total ion chromatogram of all the standards solution are shown respectively in annex D.

6.2.4 Parallel test

Parallel test is conducted to the same sample according to the procedure mentioned above.

6.2.5 Blank test

Blank test is conducted according to the procedure performed above without sample addition.

7 Calculation and expression of result

Calculate the residue content of pesticide in the test sample by the data processor of GC-MS, or according to the following formula (1).

$$x_i = \frac{A_i \times c_i \times V}{A_{si} \times m} \dots\dots\dots (1)$$

Where

x_i ——The residue content of pesticide in the test sample (mg/kg) ;

A_i ——The peak area of pesticide in the matrix standard working solution;

c_i ——The concentration of pesticide in the matrix standard working solution(mg/L) ;

V ——The final volume of sample solution(mL) ;

A_{si} ——The peak area of pesticide in the matrix standard working solution;

m ——The corresponding mass of test sample in the final sample solution(g).

8 Limit of quantification (LOQ) and recovery

8.1 Limit of quantification

The limit of quantification of the method for 88 pesticide residues in fruits and vegetables such as carrot, cabbage, ginger, apple, pear, peach, strawberry, spinach, watermelon, orange cowpea and pitaya, etc. was 0.008 mg/kg except the residue of quinoclamine in orange.

8.2 Recovery

Recycling experiments were performed by adding levels of 0.008 mg/kg, 0.020 mg/kg, and 0.040 mg/kg of 88 pesticides to blank samples of carrot, cabbage, ginger, apple, pear, peach, strawberry, spinach, watermelon, cowpea, orange and pitaya recovery rates and precision data of these pesticides in the matrix were shown in annex E.

Annex A
(Normative)

Name, CAS number and other information of 88 pesticides

Table A.1 Name, CAS number and other information of 88 pesticides

NO	Compound name	Molecular	CAS number	Group	Solvent
1	dichlorvos	$C_4H_7Cl_2O_4P$	62-73-7	C	acetone
2	tecnazene	$C_6HCl_4NO_2$	117-18-0	B	acetone + hexane
3	ethoprophos	$C_8H_{19}O_2PS_2$	13194-48-4	C	acetone
4	benfluralin	$C_{13}H_{16}F_3N_3O_4$	1861-40-1	B	acetone + hexane
5	cadusaphos	$C_{10}H_{23}O_2PS_2$	95465-99-9	A	acetone
6	alpha-BHC	$C_6H_6Cl_6$	319-84-6	C	acetone
7	thiometon	$C_8H_{15}O_2PS_3$	640-15-3	A	acetone
8	dicloran	$C_8H_4Cl_7N_2O_2$	99-30-9	B	acetone + hexane
9	dimethipin	$C_6H_{10}O_4S_2$	55290-64-7	A	acetone
10	beta-BHC	$C_6H_6Cl_6$	319-85-7	C	acetone
11	gamma-BHC	$C_6H_6Cl_6$	58-89-9	A	acetone
12	cyanophos	$C_5H_{10}NO_2PS$	2636-26-2	B	acetone + hexane
13	quintozene	$C_6Cl_5NO_2$	82-68-8	B	acetone + hexane
14	propyzamide	$C_{12}H_{11}Cl_2NO$	23950-58-5	B	acetone + hexane
15	diazinon	$C_{12}H_{21}N_2O_3PS$	333-41-5	A	acetone
16	delta-BHC	$C_6H_6Cl_6$	319-86-8	C	acetone
17	tefluthrin	$C_{11}H_{14}ClF_7O_2$	79538-32-2	C	acetone
18	tri-allate	$C_{10}H_{16}Cl_3NOS$	2303-17-5	B	acetone + hexane
19	propanil	$C_8H_9Cl_2NO$	709-98-8	B	acetone + hexane
20	bromobutide	$C_{15}H_{22}BrNO$	74712-19-9	B	acetone + hexane
21	vinclozolin	$C_{12}H_8Cl_2NO_3$	50471-44-8	B	acetone + hexane
22	chlorpyriphos-methyl	$C_7H_7Cl_3NO_3PS$	5598-13-0	B	acetone + hexane
23	tolclofos-methyl	$C_9H_{11}Cl_2O_3PS$	57018-04-9	C	acetone
24	fenitrothion	$C_9H_{12}NO_5PS$	122-14-5	A	acetone
25	quinoclamine	$C_{10}H_6ClNO_2$	2797-51-5	B	acetone + hexane
26	malathion	$C_{10}H_{19}O_6PS_2$	121-75-5	C	acetone
27	dimethylvinphos	$C_{10}H_{10}Cl_3O_4P$	71363-52-5	C	acetone
28	chlorpyrifos	$C_8H_{11}Cl_3NO_3PS$	2921-88-2	A	acetone
29	parathion	$C_{10}H_{14}NO_5PS$	56-38-2	A	acetone

Table A.1 (continued)

NO	Compound name	Molecular	CAS number	Group	Solvent
30	triadimefon	C ₁₄ H ₁₆ ClN ₃ O ₂	43121-43-3	B	acetone + hexane
31	chlorthal-dimethyl	C ₁₀ H ₆ Cl ₄ O ₄	1861-32-1	B	acetone + hexane
32	nitrothal-isopropyl	C ₁₄ H ₁₇ NO ₅	10552-74-6	B	acetone + hexane
33	fthalide	C ₈ H ₂ Cl ₄ O ₂	27355-22-2	B	acetone + hexane
34	bromophos	C ₁₀ H ₁₂ BrCl ₂ O ₃ PS	4824-78-6	B	acetone + hexane
35	pendimethalin	C ₁₃ H ₁₉ N ₃ O ₄	40487-42-1	A	acetone
36	pyrifenox	C ₁₄ H ₁₂ Cl ₂ N ₂ O	88283-41-4	A	acetone
37	allethrin	C ₁₉ H ₂₆ O ₃	584-79-2	B	acetone + hexane
38	chlorfenvinphos	C ₁₂ H ₁₄ Cl ₃ O ₄ P	470-90-6	C	acetone
39	quinalphos	C ₁₂ H ₁₅ N ₂ O ₃ PS	13593-03-8	C	acetone
40	fipronil	C ₁₂ H ₄ Cl ₂ F ₆ N ₄ OS	120068-37-3	B	acetone + hexane
41	phenthoate	C ₁₂ H ₁₇ O ₄ PS ₂	2597-03-7	A	acetone
42	methidathion	C ₆ H ₁₁ N ₂ O ₄ PS ₃	950-37-8	B	acetone + hexane
43	alpha-endosulfan	C ₉ H ₆ Cl ₆ O ₃ S	959-98-8	B	acetone + hexane
44	tetrachlorvinphos	C ₁₀ H ₉ Cl ₄ O ₄ P	22248-79-9	B	acetone + hexane
45	imazamethabenz-methyl	C ₁₆ H ₂₀ N ₂ O ₃	81405-85-8	B	acetone + hexane
46	flutolanil	C ₁₇ H ₁₆ F ₃ NO ₂	66332-96-5	C	acetone
47	prothiofos	C ₁₁ H ₁₅ Cl ₂ O ₂ PS ₂	34643-46-4	A	acetone
48	isoprothiolane	C ₁₂ H ₁₈ O ₄ S ₂	50512-35-1	B	acetone + hexane
49	<i>p, p'</i> -DDE	C ₁₄ H ₈ Cl ₄	72-55-9	C	acetone
50	tribufos	C ₁₂ H ₂₇ OPS ₃	78-48-8	B	acetone + hexane
51	oxadiazon	C ₁₅ H ₁₆ Cl ₂ N ₂ O ₃	19666-30-9	B	acetone + hexane
52	flamprop-methyl	C ₁₇ H ₁₅ ClFNO ₃	52756-25-9	B	acetone + hexane
53	oxyfluorfen	C ₁₅ H ₁₁ ClF ₃ NO ₄	42874-03-3	B	acetone + hexane
54	bupirimate	C ₁₃ H ₂₄ N ₄ O ₃ S	41483-43-6	B	acetone + hexane
55	kresoxim-methyl	C ₁₈ H ₁₉ NO ₄	143390-89-0	B	acetone + hexane
56	isoxathion	C ₁₃ H ₁₆ NO ₄ PS	18854-01-8	B	acetone + hexane
57	beta-endosulfan	C ₉ H ₆ Cl ₆ O ₃ S	33213-65-9	B	acetone + hexane
58	chlorfenapyr	C ₁₅ H ₁₁ BrClF ₃ N ₂ O	122453-73-0	B	acetone + hexane
59	<i>p, p'</i> -DDD	C ₁₄ H ₁₀ Cl ₄	72-54-8	A	acetone
60	ethion	C ₉ H ₂₂ O ₄ P ₂ S ₄	563-12-2	B	acetone + hexane
61	fluacrypyrim	C ₂₀ H ₂₁ F ₃ N ₂ O ₅	229977-93-9	B	acetone + hexane
62	carfentrazone-ethyl	C ₁₅ H ₁₄ Cl ₂ F ₃ N ₃ O ₃	128639-02-1	B	acetone + hexane
63	norflurazon	C ₁₂ H ₉ ClF ₃ N ₃ O	27314-13-2	B	acetone + hexane

Table A.1 (continued)

NO	Compound name	Molecular	CAS number	Group	Solvent
64	Propiconazole	C ₁₅ H ₁₇ Cl ₂ N ₃ O ₂	60207-90-1	C	acetone
65	trifloxystrobin	C ₂₀ H ₁₉ F ₃ N ₂ O ₄	141517-21-7	B	acetone + hexane
66	diclofop-methyl	C ₁₆ H ₁₄ Cl ₂ O ₄	51338-27-3	B	acetone + hexane
67	EPN	C ₁₄ H ₁₄ NO ₄ PS	2104-64-5	A	acetone
68	piperophos	C ₁₄ H ₂₈ NO ₃ PS ₂	24151-93-7	B	acetone + hexane
69	bifenthrine	C ₂₃ H ₂₂ ClF ₃ O ₂	82657-04-3	B	acetone + hexane
70	fenpropathrin	C ₂₂ H ₂₃ NO ₃	64257-84-7	B	acetone + hexane
71	fenamidone	C ₁₇ H ₁₇ N ₃ OS	161326-34-7	B	acetone + hexane
72	tetradifon	C ₁₂ H ₆ Cl ₄ O ₂ S	116-29-0	B	acetone + hexane
73	phosalone	C ₁₂ H ₁₅ ClNO ₄ PS ₂	2310-17-0	C	acetone
74	cyhalothrin	C ₂₃ H ₁₉ ClF ₃ NO ₃	68085-85-8	C	acetone
75	fenarimol	C ₁₇ H ₁₂ Cl ₂ N ₂ O	60168-88-9	C	acetone
76	pyrazophos	C ₁₄ H ₂₀ N ₃ O ₅ PS	13457-18-6	B	acetone + hexane
77	acrinathrin	C ₂₆ H ₂₁ F ₆ NO ₅	101007-06-1	A	acetone
78	pyridaben	C ₁₉ H ₂₅ ClN ₂ OS	96489-71-3	C	acetone
79	cyfluthrin	C ₂₂ H ₁₈ Cl ₂ FNO ₃	68359-37-5	A	acetone
80	cypermethrin	C ₂₂ H ₁₉ Cl ₂ NO ₃	52315-07-8	C	acetone
81	halfenprox	C ₂₄ H ₂₃ BrF ₂ O ₃	111872-58-3	A	acetone
82	flucythrinate	C ₂₆ H ₂₃ F ₂ NO ₄	70124-77-5	C	acetone
83	fenvalerate	C ₂₅ H ₂₂ ClNO ₃	51630-58-1	A	acetone
84	flumioxazin	C ₁₉ H ₁₅ FN ₂ O ₄	103361-09-7	B	acetone + hexane
85	fluvalinate	C ₂₆ H ₂₂ ClF ₃ N ₂ O ₃	69409-94-5	C	acetone
86	difenoconazole	C ₁₉ H ₁₇ Cl ₂ N ₃ O ₃	119446-68-3	A	acetone
87	deltamethrin	C ₂₂ H ₁₉ Br ₂ NO ₃	52918-63-5	C	acetone
88	flumiclorac-pentyl	C ₂₁ H ₂₃ ClFNO ₅	87546-18-7	B	acetone + hexane

Note: The ratio of "acetone + hexane" is 1 : 1 (V_{acetone} : V_{hexane} = 1 : 1)

Annex B (Informative)

Retention time, selected ions, abundance of ions of 88 pesticides

Table B.1 Retention time ,selected ions .abundance of ions of 88 pesticides

NO	Name	Retention time/min	Quantification	Confirmation 1	Confirmation 2	Confirmation 3
1	dichlorvos	6.99	125(100)	134(33)	170(7)	—
2	tecnazene	10.46	215(100)	213(80)	231(30)	—
3	ethoprophos	10.75	199(100)	200(12)	201(15)	—
4	benfluralin	11.39	335(100)	305(45)	336(15)	—
5	cadusaphos	11.60	213(100)	215(9)	214(9)	211(2)
6	alpha-BHC	12.02	71(100)	73(58)	35(21)	255(20)
7	thiometon	12.14	157(100)	159(8)	158(4)	—
8	dicloran	12.40	206(100)	208(60)	190(10)	210(9)
9	dimethipin	12.82	128(100)	64(42)	91(32)	210(22)
10	beta-BHC	12.99	71(100)	73(61)	35(30)	255(9)
11	gamma-BHC	13.23	71(100)	73(60)	255(29)	35(26)
12	cyanophos	13.34	134(100)	141(41)	135(10)	—
13	quintozene	13.39	249(100)	24(67)	265(47)	—
14	propyzamide	13.43	255(100)	257(62)	188(8)	—
15	diazinon	13.79	169(100)	170(5)	171(5)	—
16	delta-BHC	14.25	71(100)	73(63)	255(18)	35(17)
17	tefluthrin	14.25	241(100)	243(35)	205(24)	—
18	tri-allate	14.40	160(100)	161(12)	162(7)	—
19	propanil	15.54	217(100)	219(66)	221(11)	—
20	bromobutide	15.68	81(100)	79(98)	232(18)	—
21	vinclozolin	16.01	241(100)	243(67)	245(13)	—
22	chlorpyrifos-methyl	16.05	212(100)	214(95)	141(62)	216(31)
23	tolclofos-methyl	16.26	250(100)	264(37)	141(35)	95(28)
24	fenitrothion	17.51	168(100)	277(23)	141(18)	—
25	quinoclamine	17.79	207(100)	208(13)	209(31)	—
26	malathion	18.14	172(100)	157(60)	173(11)	—
27	dimethylvinphos	18.64	125(100)	35(4)	126(4)	—
28	chlorpyrifos	18.71	313(100)	212(72)	95(19)	—
29	parathion	18.77	154(100)	291(29)	155(8)	—
30	triadimefon	18.91	127(100)	166(98)	129(31)	68(6)

Table B.1 (continued)

NO	Name	Retention time/min	Quantification	Confirmation 1	Confirmation 2	Confirmation 3
31	chlorthal-dimethyl	18.99	332(100)	330(91)	334(54)	300(8)
32	nitrothal-isopropyl	19.26	295(100)	296(19)	279(5)	—
33	fthalide	19.54	272(100)	274(48)	228(40)	226(30)
34	bromophos	19.71	257(100)	255(64)	81(22)	141(9)
35	pendimethalin	20.69	281(100)	251(10)	219(8)	188(7)
36	(Z)-pyrifenox	20.96	226(100)	228(34)	35(5)	—
	(E)-pyrifenox	22.66	226(100)	228(34)	261(12)	—
37	allethrin-1,2	21.12	167(100)	134(16)	168(11)	—
	allethrin-3,4	21.40	167(100)	134(13)	168(11)	—
38	chlorfenvinphos	21.31	153(100)	154(5)	35(2)	—
39	quinalphos	21.43	169(100)	298(16)	171(7)	—
40	fipronil	21.49	384(100)	331(52)	386(38)	—
41	phenthoate	21.49	157(100)	159(9)	158(5)	—
42	methidathion	22.30	157(100)	159(13)	156(10)	—
43	alpha-endosulfan	22.83	242(100)	240(81)	244(49)	—
44	tetrachlorvinphos	23.10	125(100)	224(20)	222(19)	200(10)
45	imazamethabenz-methyl	23.45	256(100)	257(19)	258(2)	—
46	flutolanil	24.27	307(100)	281(78)	174(37)	—
47	prothiofos	24.27	237(100)	301(60)	269(34)	199(15)
48	isoprothiolane	24.48	262(100)	263(17)	264(13)	—
49	p,p'-DDE	24.72	35(100)	37(28)	318(2)	—
50	tribufos	24.78	257(100)	259(14)	258(14)	225(4)
51	oxadiazon	25.29	267(100)	344(64)	346(38)	42(25)
52	flamprop-methyl	25.55	248(100)	249(16)	250(33)	—
53	oxyfluorfen	25.78	296(100)	361(14)	332(11)	—
54	bupirimate	25.98	208(100)	124(35)	209(13)	—
55	kresoxim-methyl	26.17	107(100)	174(20)	108(8)	—
56	isoxathion	26.27	169(100)	170(14)	171(13)	—
57	beta-endosulfan	26.80	242(100)	240(82)	336(49)	406(42)
58	chlorfenapyr	26.89	349(100)	347(86)	269(94)	271(29)
59	p,p'-DDD	27.75	248(31)	35(100)	71(46)	250(22)
60	ethion	28.28	185(100)	187(10)	186(7)	—
61	fluacrypyrim	29.92	221(100)	222(12)	—	—
62	carfentrazone-ethyl	30.37	375(100)	288(85)	355(40)	314(21)

Table B.1 (continued)

NO	Name	Retention time/min	Quantification	Confirmation 1	Confirmation 2	Confirmation 3
63	norflurazon	30.50	267(100)	268(14)	—	—
64	propiconazole	30.86	256(100)	258(67)	220(56)	218(24)
65	trifloxystrobin	31.35	190(100)	202(46)	174(32)	301(21)
66	diclofop-methyl	32.14	217(100)	219(33)	35(13)	218(14)
67	EPN	34.65	138(100)	154(27)	323(7)	201(7)
68	piperophos	35.17	213(100)	214(9)	215(8)	—
69	bifenthrin	35.30	205(100)	241(35)	386(29)	190(25)
70	fenpropathrin	35.71	141(100)	142(9)	—	—
71	fenamidone	35.92	296(100)	297(18)	298(6)	219(6)
72	tetradifon	36.66	320(100)	318(80)	245(18)	243(18)
73	phosalone	37.38	185(100)	187(10)	186(8)	—
74	cyhalothrin-1	38.52	241(100)	205(99)	187(44)	243(32)
	cyhalothrin-2	39.06	241(100)	205(99)	187(34)	243(32)
75	fenarimol	38.88	276(100)	277(37)	278(39)	294(8)
76	pyrazophos	39.50	169(100)	236(14)	373(9)	—
77	acrinathrin	39.68	333(100)	167(40)	305(9)	—
78	pyridaben	40.70	217(100)	219(39)	197(36)	183(33)
79	cyfluthrin-1	41.73	207(100)	209(54)	171(63)	173(13)
	cyfluthrin-2	41.90	207(100)	209(61)	171(49)	173(13)
	cyfluthrin-3	42.04	207(100)	209(61)	171(29)	173(8)
	cyfluthrin-4	42.11	207(100)	209(60)	171(31)	173(9)
80	cypermethrin-1	42.26	207(100)	209(67)	171(46)	173(17)
	cypermethrin-2	42.46	207(100)	209(65)	171(50)	173(19)
	cypermethrin-3	42.59	207(100)	209(63)	171(29)	173(10)
	cypermethrin-4	42.67	207(100)	209(63)	171(32)	173(17)
81	halfenprox	42.30	81(100)	79(95)	397(2)	—
82	flucythrinate-1	42.67	243(100)	199(24)	244(13)	—
	flucythrinate-2	43.06	243(100)	199(17)	244(13)	—
83	fenvalerate-1	44.06	211(100)	213(33)	167(29)	—
	fenvalerate-2	44.54	211(100)	213(33)	167(16)	—
84	flumioxazin	44.19	354(100)	355(20)	356(4)	—
85	fluvalinate-1	44.55	294(100)	296(33)	295(15)	258(8)
	fluvalinate-2	44.71	294(100)	296(34)	295(14)	258(7)

Table B.1 (continued)

NO	Name	Retention time/min	Quantification	Confirmation 1	Confirmation 2	Confirmation 3
86	difenoconazole-1	45.01	310(100)	312(40)	126(18)	348(12)
	difenoconazole-2	45.17	310(100)	312(95)	348(69)	350(41)
87	deltamethrin-1	45.34	81(100)	79(97)	137(57)	297(53)
	deltamethrin-2	45.89	81(100)	79(97)	137(57)	297(53)
88	flumiclorac-pentyl	46.33	423(100)	424(23)	425(34)	—

Annex C
(Informative)
Groups of selected ion and dwell time

Table C.1 Groups of selected ion and dwell time

Group	Time/min	Selected ion	Dwell/ms
1	6.50	125, 134, 170	100
2	8.00	213, 215, 231	100
3	10.63	199, 200, 201	100
4	11.10	305, 335, 336	100
5	11.50	211, 213, 214, 215	100
6	11.85	35, 71, 73, 255	100
7	12.09	157, 158, 159	100
8	12.30	190, 206, 208, 210	100
9	12.60	35, 64, 71, 73, 91, 128, 210, 255	50
10	13.27	134, 135, 141, 188, 247, 249, 255, 257, 265	30
11	13.70	169, 170, 171	100
12	14.00	35, 71, 73, 160, 161, 162, 205, 241, 243, 255	30
13	15.30	79, 81, 217, 219, 221, 232	80
14	15.90	141, 212, 214, 216, 241, 243, 245	50
15	16.18	95, 141, 250, 264	100
16	17.10	141, 168, 277	100
17	17.68	207, 208, 209	100
18	18.03	157, 172, 173	100
19	18.43	35, 95, 125, 126, 154, 155, 212, 291, 313	40
20	18.82	68, 127, 129, 166, 300, 330, 332, 334	50
21	19.18	279, 295, 296	100
22	19.40	81, 141, 226, 228, 255, 257, 272, 274	50
23	20.30	188, 219, 251, 281	100
24	20.85	35, 226, 228	100
25	21.05	134, 153, 154, 157, 158, 159, 167, 168, 169, 171, 298, 331, 384, 386	30
26	22.20	156, 157, 159	100
27	22.50	226, 228, 240, 242, 244, 261	70
28	22.98	125, 220, 222, 224	100
29	23.30	256, 257, 258	100
30	24.00	174, 199, 237, 269, 281, 301, 307	50

表 C.1 (continued)

Group	Time/min	Selected ion	Dwell/ms
31	24.38	262,263,264	100
32	24.62	35,37,225,257,258,259	70
33	25.15	42,267,344,346	100
34	25.46	107,108,124,169,170,171,174,208,209,248,249,250,296,332,361	30
35	26.62	240,242,269,271,336,347,349,406	50
36	27.50	35,71,248,250	100
37	28.15	185,186,187	100
38	29.80	221,222	100
39	30.20	267,268,288,314,355,375	70
40	30.74	218,220,256,258	100
41	31.25	174,190,202,301	100
42	31.90	35,217,218,219	100
43	34.00	138,154,201,323	100
44	34.90	190,205,213,214,215,241,386	50
45	35.60	141,142	100
46	35.80	219,296,297,298	100
47	36.40	243,245,318,320	100
48	37.15	185,186,187	100
49	38.13	187,205,241,243	100
50	38.70	276,277,278,294	100
51	39.00	187,205,241,243	100
52	39.40	169,236,373	100
53	39.62	167,305,333	100
54	40.50	183,197,217,219	100
55	41.60	79,81,171,173,199,207,209,243,244,397	40
56	42.90	199,243,244	100
57	43.70	167,211,213,258,294,295,296,354,355,356	30
58	44.90	126,310,312,348,350	80
59	45.28	79,81,137,297	100
60	46.10	423,424,425	100

Annex D
(Informative)

GC-NCI-MS chromatogram of the 88 pesticide standard solution

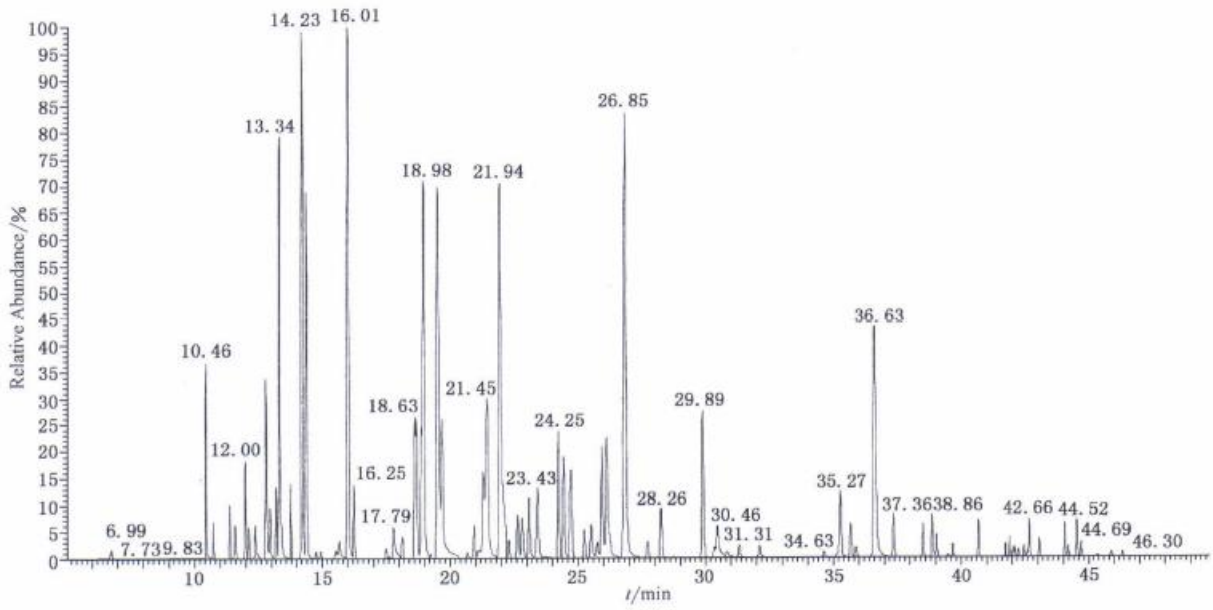


Figure D.1 GC-NCI-MS chromatogram of the 88 pesticide standard solution

Annex E
(Informative)

Recovery range of pesticide residues in carrot, cabbage, ginger, apple, pear, peach, strawberry, spinach, watermelon, cowpea, orange and pitaya

Table E.1 Recovery range of pesticide residues in carrot, cabbage, ginger, apple, pear, peach, strawberry, spinach, watermelon, cowpea, orange and pitaya

NO	Compound name	spiked level/ (mg/kg)	range of recovery (spiked level is 0.008 mg/kg~0.040 mg/kg)/%											
			carrot	cabbage	ginger	apple	pear	peach	strawberry	spinach	watermelon	cowpea	orange	pitaya
1	dichlorvos	0.008	64~86	66~79	66~99	60~89	69~86	61~82	72~80	62~89	70~92	67~93	67~96	67~98
		0.020	62~82	66~83	73~94	67~80	65~77	70~86	75~98	70~82	78~97	69~95	74~94	73~92
		0.040	70~84	71~85	72~95	68~79	79~99	71~90	76~97	72~94	77~100	72~91	75~98	72~99
2	tecnazene	0.008	60~85	68~92	80~90	70~86	79~99	61~74	61~71	62~77	70~97	70~96	67~97	66~95
		0.020	71~92	68~78	82~104	66~80	68~81	65~81	68~95	70~78	76~100	71~99	76~90	72~101
		0.040	72~83	71~94	70~106	68~82	69~90	68~86	71~92	72~81	73~98	78~101	75~96	72~93
3	ethoprophos	0.008	62~80	70~98	76~88	80~98	72~107	66~87	62~71	63~76	66~103	68~99	68~90	67~100
		0.020	71~97	72~84	72~105	70~83	70~95	70~99	68~85	71~83	75~102	74~106	72~85	80~104
		0.040	70~86	80~94	90~104	76~91	71~97	73~98	72~102	76~80	74~100	80~103	72~97	77~107
4	benfluralin	0.008	68~96	61~94	92~104	74~88	74~88	60~82	69~92	63~89	65~100	73~102	73~106	77~102
		0.020	70~95	86~102	94~105	70~83	67~81	71~84	75~101	72~83	77~105	71~104	76~107	81~108
		0.040	84~99	73~87	92~110	76~88	70~80	70~82	77~97	73~89	75~98	81~102	76~104	80~103
5	cadusaphos	0.008	60~72	72~95	81~98	81~93	70~98	68~78	61~74	62~77	64~99	70~99	67~98	70~92
		0.020	71~87	71~89	71~101	70~84	71~89	71~98	70~97	63~79	71~100	74~104	73~100	79~101
		0.040	70~87	80~93	74~88	71~88	73~90	70~86	74~94	70~82	76~104	80~102	79~98	75~99
6	alpha-BHC	0.008	60~71	62~77	60~76	61~77	60~71	61~73	62~76	63~80	63~96	67~90	66~97	69~86
		0.020	61~90	63~76	67~80	61~78	63~80	61~74	66~89	87~104	72~97	73~100	73~90	73~87
		0.040	77~87	70~87	88~99	62~80	71~88	70~87	70~91	81~95	80~98	77~97	70~97	71~88

Table E.1 (continued)

NO	Compound name	spiked level/ (mg/kg)	range of recovery/(spiked level is 0.008 mg/kg~0.040 mg/kg)/%												
			carrot	cabbage	ginger	apple	pear	peach	strawberry	spinach	watermelon	cowpea	orange	pitaya	
7	thiometon	0.008	62~78	63~89	73~95	75~88	75~94	63~89	60~73	68~80	69~96	73~99	73~97	67~86	
		0.020	70~94	72~90	67~98	65~79	73~84	70~96	70~85	71~82	76~101	73~104	74~98	73~93	
		0.040	70~82	70~84	74~90	70~84	71~81	70~88	72~99	70~81	77~100	79~100	78~95	76~92	
8	dicloran	0.008	61~78	63~79	63~90	84~104	68~86	63~85	63~76	64~86	66~95	73~96	70~98	73~94	
		0.020	70~97	70~84	93~109	78~96	75~82	71~83	70~92	73~86	78~105	71~101	79~101	77~108	
		0.040	71~85	70~88	71~105	73~90	70~87	72~84	71~90	73~90	77~102	72~107	78~102	75~104	
9	dimethipin	0.008	71~82	79~102	61~84	65~95	98~119	89~110	64~88	85~104	71~95	71~95	71~94	65~81	
		0.020	72~101	77~106	64~88	80~104	79~110	83~108	80~110	81~109	80~102	72~92	76~99	71~89	
		0.040	70~82	93~110	70~105	75~90	90~107	92~109	87~107	85~110	82~107	80~104	73~97	70~83	
10	beta-BHC	0.008	61~70	63~81	60~74	60~75	60~74	60~72	62~82	65~76	68~89	68~93	69~99	69~95	
		0.020	69~94	63~79	68~82	62~81	61~74	63~83	70~82	82~105	74~99	71~97	71~97	74~90	
		0.040	71~82	70~82	72~95	61~85	72~87	73~90	71~90	76~99	76~100	70~102	73~94	71~90	
11	gamma-BHC	0.008	65~78	61~78	62~76	61~74	65~76	61~71	60~74	65~75	69~93	67~98	70~98	64~92	
		0.020	65~99	63~76	67~103	62~76	62~75	61~77	69~86	83~102	72~94	73~104	71~94	71~87	
		0.040	77~98	72~82	80~95	62~82	71~85	71~89	72~94	76~98	77~98	79~95	71~91	72~89	
12	cyanophos	0.008	61~73	69~92	63~92	79~98	75~101	84~96	62~76	68~86	68~99	70~103	74~100	71~94	
		0.020	71~96	71~90	70~98	71~88	72~82	73~95	71~95	74~103	76~101	76~108	82~104	75~99	
		0.040	70~90	85~101	80~109	76~98	70~86	73~109	79~102	72~98	78~106	78~102	77~101	70~95	
13	quintozene	0.008	60~93	64~83	83~91	69~86	78~90	61~74	60~77	64~88	67~98	70~97	72~96	65~96	
		0.020	67~94	72~84	71~105	66~77	70~83	65~84	73~97	70~80	76~96	77~99	75~98	75~103	
		0.040	74~100	71~85	71~107	70~82	69~81	66~84	73~92	71~85	73~97	73~104	78~100	73~99	

Table E.1 (continued)

NO	Compound name	spiked level/ (mg/kg)	range of recovery(spiked level is 0.008 mg/kg~0.040 mg/kg)/%											
			carrot	cabbage	ginger	apple	pear	peach	strawberry	spinach	watermelon	cowpea	orange	pitaya
14	propyzamide	0.008	68~87	63~83	88~105	68~88	71~97	69~81	61~78	63~80	63~94	69~95	71~100	67~92
		0.020	82~96	70~87	71~101	67~80	70~86	70~88	70~80	72~87	76~98	73~99	75~108	74~104
		0.040	73~86	73~84	73~93	71~84	70~90	72~87	74~97	74~82	77~97	80~103	79~107	76~97
15	diazinon	0.008	63~78	79~100	79~102	64~78	74~106	68~79	62~80	68~85	68~94	70~103	74~99	62~99
		0.020	77~93	71~92	71~97	71~80	71~82	70~84	72~102	74~91	75~99	74~104	74~102	75~92
		0.040	71~80	82~97	76~95	72~82	71~83	70~88	76~95	78~93	77~104	83~98	80~99	70~93
16	delta-BHC	0.008	62~86	62~77	60~72	63~77	62~77	60~73	61~72	63~76	71~97	72~98	69~101	62~90
		0.020	68~78	64~78	70~78	66~75	64~78	64~84	71~87	81~99	77~96	71~105	77~99	75~91
		0.040	72~81	73~84	74~85	64~79	70~88	70~84	71~90	78~99	75~101	80~94	78~92	72~87
17	tefluthrin	0.008	75~94	80~97	80~98	64~78	79~96	63~79	70~83	66~80	73~99	71~99	73~94	76~92
		0.020	72~102	81~100	75~94	75~84	71~87	73~86	79~96	93~105	79~98	74~96	76~93	73~98
		0.040	81~89	94~100	86~93	72~86	73~83	74~89	70~100	83~92	81~105	80~103	80~101	72~95
18	tri-alleate	0.008	64~81	81~100	76~93	64~76	71~96	64~83	63~82	61~80	66~95	73~98	71~87	63~91
		0.020	78~103	71~89	71~89	74~86	70~86	71~85	74~107	76~95	73~102	71~100	72~91	71~87
		0.040	70~88	74~85	78~85	70~90	70~89	71~87	73~100	78~95	79~100	72~97	78~99	70~89
19	propanil	0.008	61~80	73~94	70~84	75~100	76~90	60~77	63~75	64~76	74~101	71~96	68~88	70~93
		0.020	71~98	70~85	73~104	71~99	70~91	80~108	71~84	72~88	73~102	70~99	71~95	76~101
		0.040	71~83	72~86	70~88	75~98	70~88	71~103	72~97	70~81	72~98	78~98	74~99	77~97
20	bromobutide	0.008	63~78	75~93	78~100	68~84	75~94	70~98	61~76	62~90	68~97	72~89	65~86	67~87
		0.020	77~107	71~91	70~108	73~87	71~88	71~86	70~86	70~83	70~108	72~97	75~97	70~86
		0.040	72~88	71~93	72~96	70~82	70~88	71~88	71~106	74~91	78~102	79~102	78~90	71~90