

Application Brief



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Pesticide Analysis

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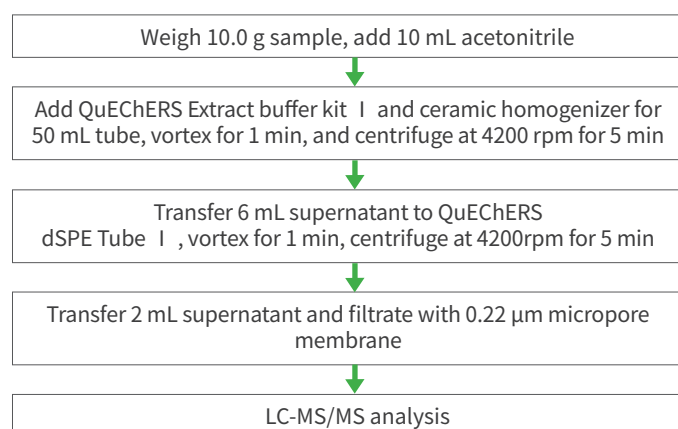
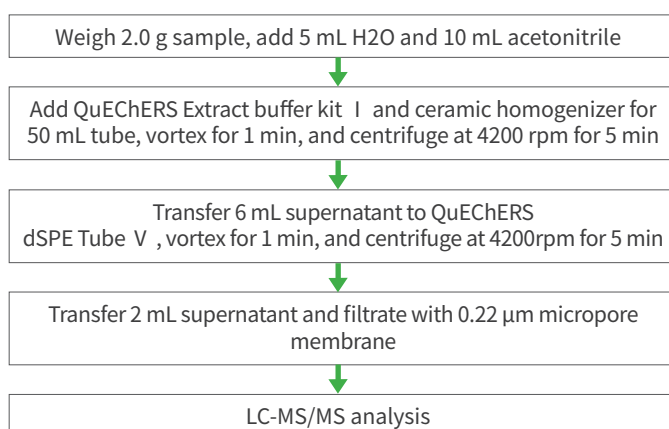
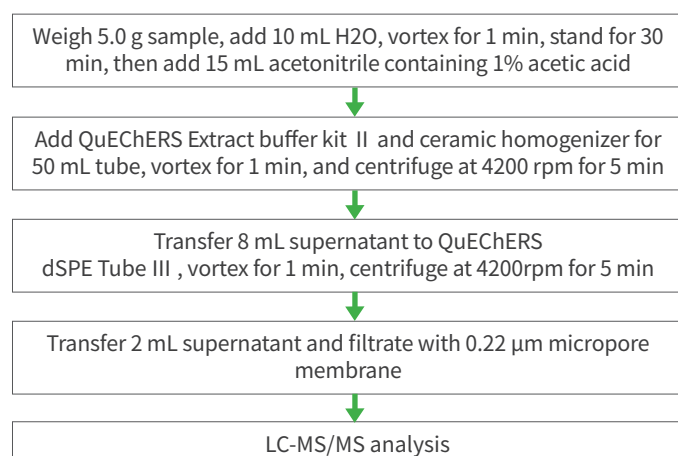
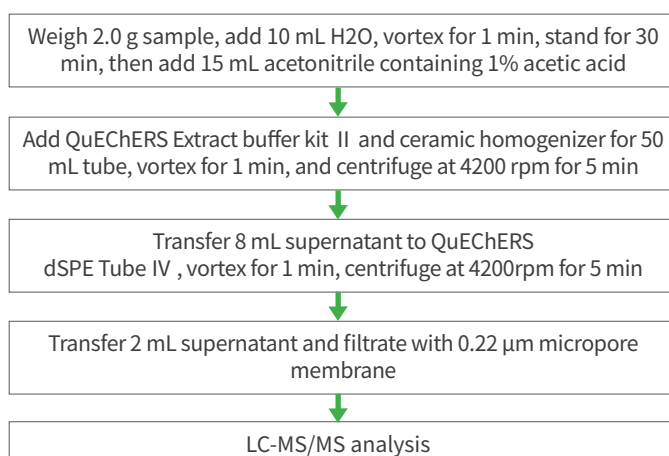


Biological Sample

- 14** Determination of enalapril and Enalaprilat in plasma

Method: GB 23200.121-2021**Determination of 331 Pesticides and Its Metabolites in Plant-Derived Foods (LC-MS/MS, SGC0E-21-16)**

- Shim-pack GIST C18-AQ LC Column (1.9 μ m, 100 $\times$ 2.1 mm, PN: 227-30807-02)
- ShimNex Filter Holder (PN: 380-00341-05)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μ m (PN: 380-00341-05)

Sample Preparation (QuEChERS Method)● **Vegetables, fruits, mushrooms and sugars**● **Vegetable oil**● **Grains, oil crops and nuts**● **Tea and spices****Analysis Condition****Instrument:** Shimadzu Nexera LC-40 XR + LCMS-8050**LC Column:** Shim-pack GIST C18-AQ (1.9 μ m, 100 $\times$ 2.1 mm, PN: 227-30807-02)**UHPLC Condition**

Flow Rate: 0.3 mL/min Column Temperature: 40 °C

Mobile Phase A: 2 mM Ammonium formate in water + 0.01% Formic acid

Mobile Phase B: 2 mM Ammonium formate in methanol + 0.01% Formic acid

Injection volume: 2 μ L (Co-injection with 10 μ L water)**Gradient Program**

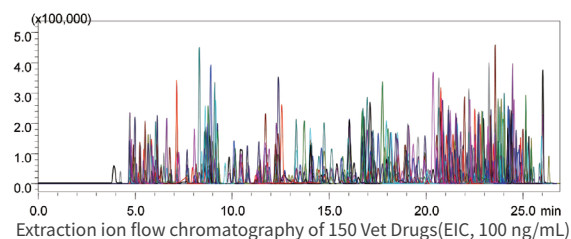
Time (Min)	0	1	1.5	2.5	18	23	27	27.1	30
A (%)	97	97	85	50	30	2	2	97	97
B (%)	3	3	15	50	70	98	98	3	3

MS Condition

Electron Ionization Mode: ESI[±]; Scan Mode: MRM

Heating block temp.: 400°C; Interface temp.: 300 °C; DL temp.: 150 °C

Heating gas flow: 10.0 L/min; Drying gas flow: 10.0 L/min; Nebulizing gas flow: 3.0 L/min; Please check the MRM parameters in GB 23200.121-2021 method



Related Application

Application Serial Number	Application Theme
SGCOE-21-16	GB 23200.121-2021 Method Total Solution: Analysis of 331 Residual Pesticides and Metabolites in Plant-Derived Food by LC-MS/MS System
SOP-21-032	Standard Operation Procedure: Analysis of 331 Residual Pesticides and Metabolites in Plant-Derived Food by LC-MS/MS System
SGLC-LCMS-048	Analysis of 331 Residual Pesticides and Metabolites in Garlic by LC-MS/MS System
SGLC-LCMS-049	Analysis of 331 Residual Pesticides and Metabolites in Grape by LC-MS/MS System
SGLC-LCMS-050	Analysis of 331 Residual Pesticides and Metabolites in Ginger by LC-MS/MS System
SGLC-LCMS-051	Analysis of 331 Residual Pesticides and Metabolites in Canola Oil by LC-MS/MS System

Related Product Kit

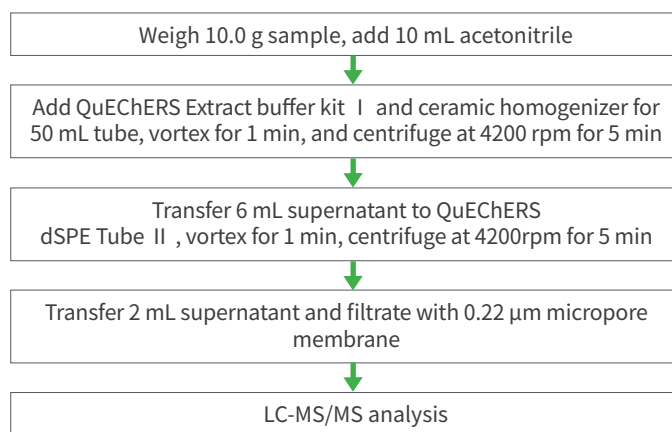
Kit Number and Description	Type	Product Number	Product Description	Sample Matrix Application
QuEChERS Extraction Kit for Pesticides Analysis in Plant-Derived Food Kit Number: PRC-KIT-001-01	QuEChERS Extraction Salt	380-00149	SHIMSEN QuEChERS Extraction Salts I , 4g MgSO ₄ , 1g NaCl, 0.5g DHS, 1g TSCD, 50/P	Vegetables, fruits, mushrooms, sugars and vegetable oil
		380-00152	SHIMSEN QuEChERS Extraction Salts II , 6g MgSO ₄ , 1.5g NaOAc, 50/P	Grains, oil crops, nuts, tea and spices
	Ceramic Homogenizer	380-00171	Ceramic Homogenizer for 50 mL Centrifuge Tube, 100/P	--
Pesticides Analysis Kit for GB 23200.121 Method Kit Number: PRC-KIT-001-03	QuEChERS dSPE Tube	380-00195	SHIMSEN QuEChERS dSPE Tube I , 15mL, 30mg PSA, 900mg MgSO ₄ 50/P	Vegetables, fruits, mushrooms and sugars with low pigment content
		380-00196-01	SHIMSEN QuEChERS dSPE Tube II , 15mL, 30mg PSA, 15mg GCB, 900mg MgSO ₄ 50/P	Vegetables, fruits, mushrooms and sugars with high pigment content
		380-00197	SHIMSEN QuEChERS dSPE Tube III , 15mL, 400mg C18, 80mg PSA, 1200mg MgSO ₄ 50/P	Grains, oil crops and nuts
		380-00145	SHIMSEN QuEChERS dSPE Tube IV , 15mL, 400mg PSA, 400mg C18, 200mg GCB, 1200mg MgSO ₄ , 50/P	Tea and spices
		380-00197-02	SHIMSEN QuEChERS dSPE, 15mL, 30mg PSA, 300mg C18, 900mg MgSO ₄ , 50/P	Vegetable oil
	LC Column	227-30807-02	Shim-pack GIST C18-AQ HP, 1.9um, 2.1×100mm	--
	Standards	380-03635	SHIMSEN PESTICIDE MIX for GB 23200.121-2021, 20ppm	--

Method: GB 23200.121-2021

Determination of 72 Pesticides and Its Metabolites in Plant-Derived Foods (LC-MS/MS, SGLC-LCMS-054)

- Shim-pack GIST C18-AQ LC Column (1.9 μm , 50 $\times$ 2.1 mm, PN: 227-30807-01)
- SHIMSEN QuEChERS Extraction Salt and dSPE Tube (PN: 380-00149, 380-00196-01)
- ShimNex Filter Holder (PN: 380-00341-05)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μm (PN: 380-00341-05)

Sample Preparation (QuEChERS Method)



Analysis Condition

Instrument: Shimadzu Nexera XR + LCMS-8060

LC Column: Shim-pack GIST C18-AQ (1.9 μm , 50 $\times$ 2.1 mm, PN: 227-30807-01)

UHPLC Condition

Flow Rate: 0.3 mL/min Column Temperature: 40 $^{\circ}\text{C}$

Mobile Phase A: 2 mM Ammonium formate in water + 0.01% Formic acid

Mobile Phase B: 2 mM Ammonium formate in methanol + 0.01% Formic acid

Injection volume: 2 μL (Co-injection with 20 μL water)

Injection volume: 2 μL (Co-injection with 10 μL water)

Gradient Program

Time (Min)	0	1	2	3	4	8	9	9.1	10
A (%)	97	97	85	50	30	2	2	97	97
B (%)	3	3	15	50	70	98	98	3	3

MS Condition

Electron Ionization Mode: ESI $\pm$; Scan Mode: MRM

Heating block temp.: 400 $^{\circ}\text{C}$; Interface temp.: 300 $^{\circ}\text{C}$; DL temp.: 150 $^{\circ}\text{C}$

Heating gas flow: 10.0 L/min; Drying gas flow: 10.0 L/min; Nebulizing gas flow: 3.0

L/min; Please check the MRM parameters in GB 23200.121-2021 method

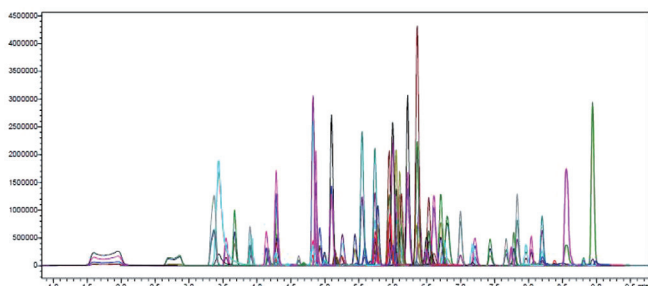


Fig1. MRM Chromatogram of Pesticides in Grape Matrix (Concentration: 10 ng/mL, Co-Injection with 10 μL Water)

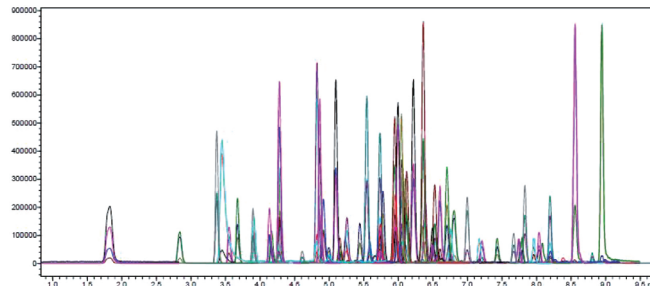


Fig2. MRM Chromatogram of Pesticides in Grape Matrix (Concentration: 10 ng/mL, Dilute 5 Times by Water before Injection)

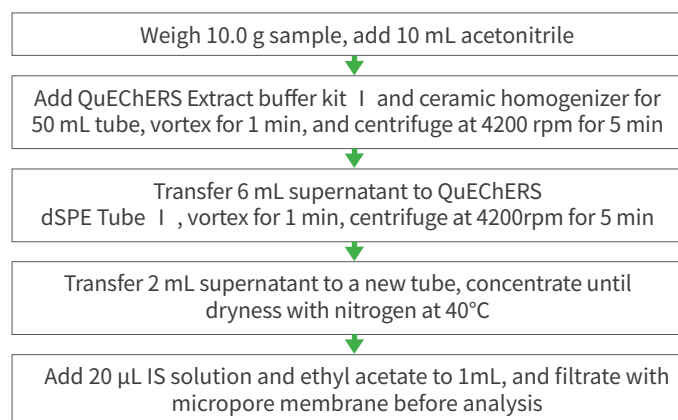
Method: GB 23200.113-2018

Determination of 208 Pesticides and Its Metabolites in Plant-Derived Foods (GC-MS/MS, SGLC-GCMS-004)

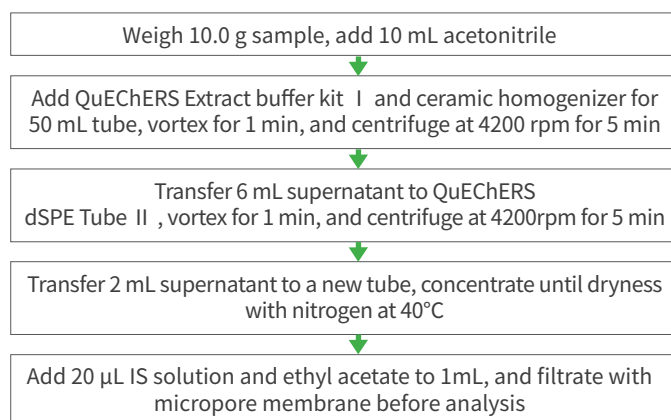
- SH-1701 GC Column (30m×0.25mm, 0.25 μm, PN: 221-75777-30)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μm (PN: 380-00341)

Sample Preparation (QuEChERS Method)

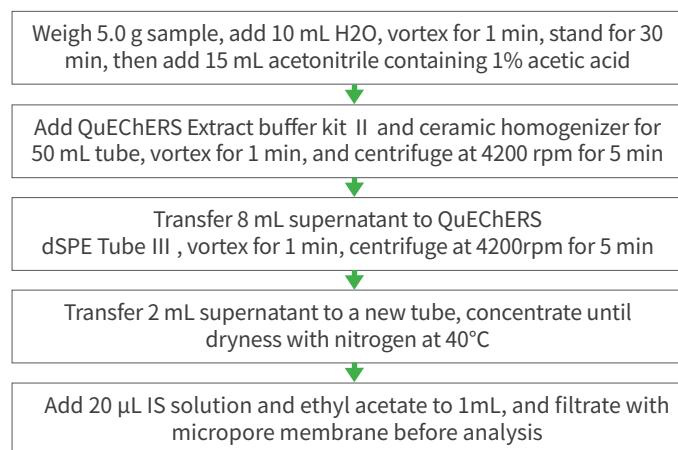
● Vegetables, fruits, mushrooms and sugars



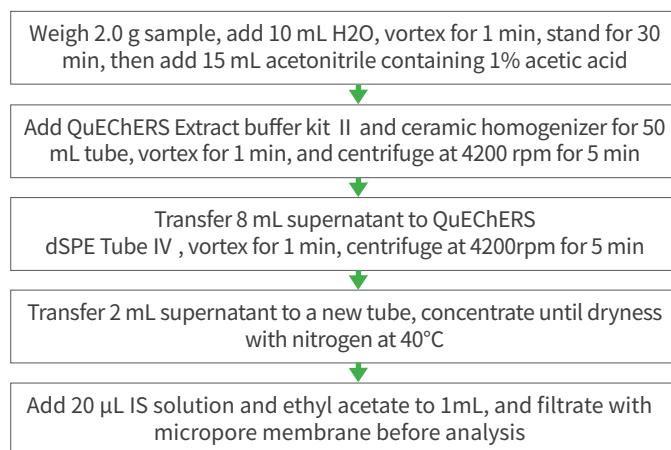
● Vegetables, fruits, mushrooms and sugars with high pigment content



● Grains, oil crops and nuts



● Tea and spices



Analysis Condition

Instrument: Shimadzu GCMS-TQ8040

GC Column: SH-1701 GC Column (30m×0.25mm, 0.25 μm, PN: 221-75777-30)

GC Condition

Column oven temp.: 40 °C (1 min), 40 °C/min to 120 °C (0 min), 5 °C/min to 240 °C (0 min), 12 °C/min to 300 °C (6 min);
Carrier gas: He; Flow rate: 1.0 mL/min; Injector temp.: 280 °C
Injection mode: Splitless; Injection volume: 1 μL;

MS Condition

Electron Ionization Mode: EI, 70 eV; Ion source temperature: 230 °C; Interface temperature: 280 °C; Solvent delay: 3 min; Scan Mode: MRM; Please check the MRM parameters in GB 23200.113-2018 method

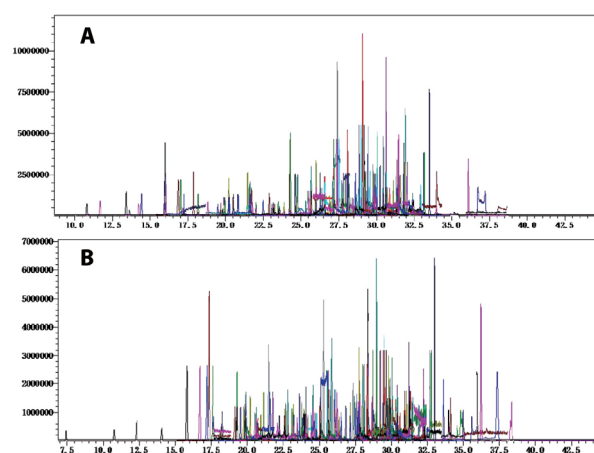


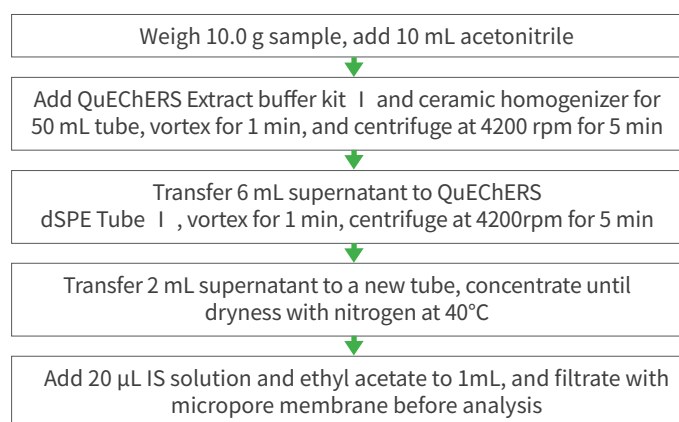
Fig. MRM Chromatogram of Pesticides Standard Mixture Solution
A, Group A, 109 Pesticides standard mixture solution; B, Group B, 113 Pesticides standard mixture solution

Method: GB 23200.113-2018 Determination of 208 Pesticides and Its Metabolites in Plant-Derived Foods (GC-MS/MS)

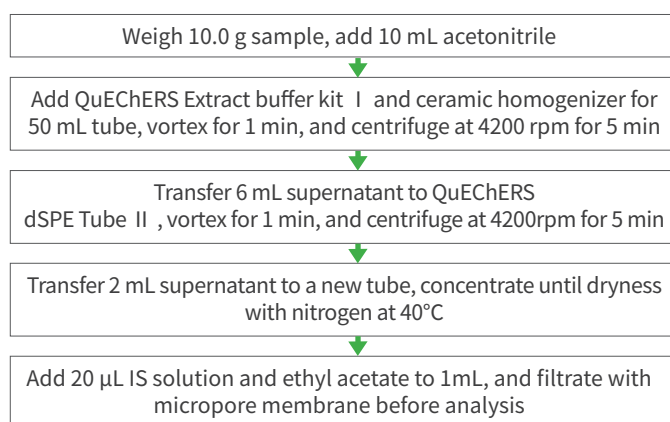
- SH-I-5Sil MS GC Column (30m×0.25mm, 0.25 μ m, PN: 221-75954-30)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μ m (PN: 380-00341)

Sample Preparation (QuEChERS Method)

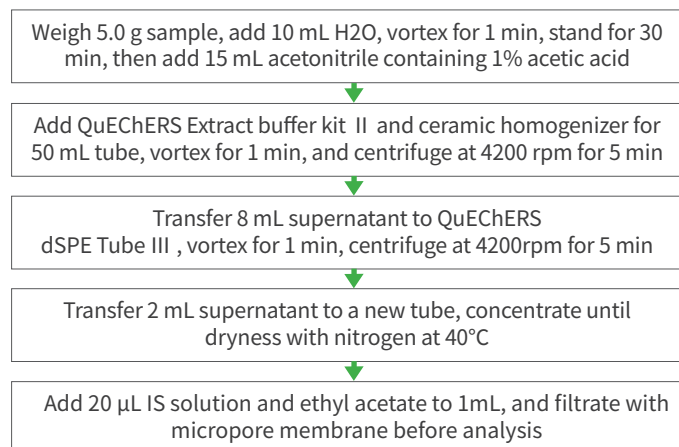
● Vegetables, fruits, mushrooms and sugars



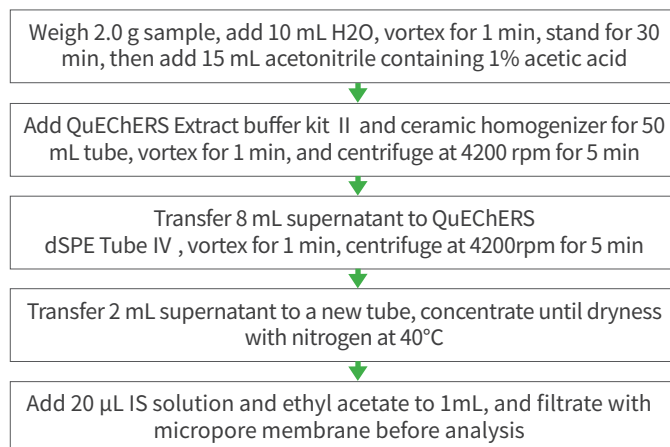
● Vegetables, fruits, mushrooms and sugars with high pigment content



● Grains, oil crops and nuts



● Tea and spices



Analysis Condition

Instrument: Shimadzu GCMS-TQ8040

GC Column: SH-I-5Sil MS GC Column (30m×0.25mm, 0.25 μ m, PN: 221-75954-30)

GC Condition

Column oven temp.: 50 °C (1 min), 25 °C/min to 125 °C (0 min), 10 °C/min to 300 °C (15 min);

Carrier gas: He; Flow rate: 1.69 mL/min; Injector temp.: 250 °C

Injection mode: Splitless; Injection volume: 1 μ L;

MS Condition

Electron Ionization Mode: EI, 70 eV; Ion source temperature: 200 °C; Interface temperature: 250 °C; Scan Mode: MRM; Please check the MRM parameters in GB 23200.113-2018 method

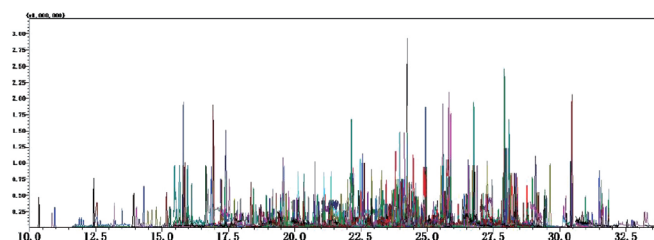


Fig. Total Ion Chromatogram of 208 Pesticides in Pumpkin Matrix
(Concentration: 50 μ g/mL)

Related Application

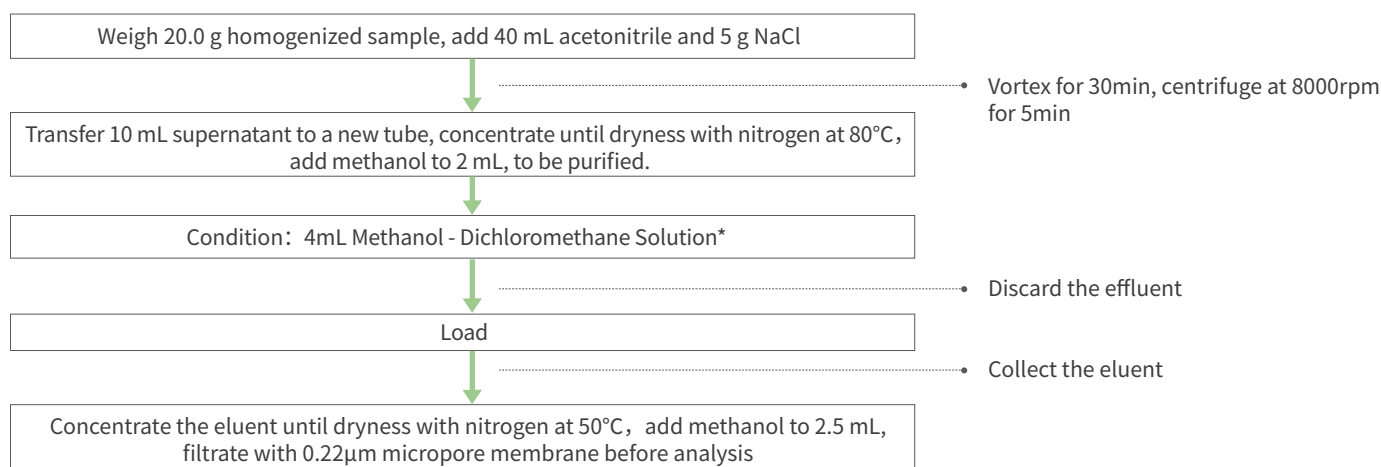
Application Serial Number	Application Theme
SOP-20-004	Standard Operation Procedure: Analysis of 208 Residual Pesticides and Metabolites in Plant-Derived Food by GC-MS/MS System
SGLC-GCMS-001	Determination of Multi-Pesticides and Metabolites in Plant-Derived Food
SGLC-GCMS-002	Analysis of Multi-Pesticides and Metabolites in Plant-Derived Food Using SHIMSEN QuEChERS and SH-I-5MS GC Column
SGLC-GCMS-004	Analysis of 208 Residual Pesticides and Metabolites in Plant-Derived Food

Related Product Kit

Kit Number and Description	Type	Product Number	Product Description	Sample Matrix Application
QuEChERS Extraction Kit for Pesticides Analysis in Plant-Derived Food Kit Number: PRC-KIT-001-01	QuEChERS Extraction Salt	380-00149	SHIMSEN QuEChERS Extraction Salts I , 4g MgSO ₄ , 1g NaCl, 0.5g DHS, 1g TSCD, 50/P	Vegetables, fruits, mushrooms and sugars
		380-00152	SHIMSEN QuEChERS Extraction Salts II , 6g MgSO ₄ , 1.5g NaOAc, 50/P	Grains, oil crops, nuts, tea and spices
	Ceramic Homogenizer	380-00171	Ceramic Homogenizer for 50 mL Centrifuge Tube, 100/P	--
Pesticides Analysis Kit for GB 23200.113 Method Kit Number: PRC-KIT-001-02	QuEChERS dSPE Tube	380-00123	SHIMSEN QuEChERS dSPE Tube I , 15mL, 150mg PSA, 900mg MgSO ₄ 50/P	Vegetables, fruits, mushrooms and sugars with low pigment content
		380-00124	SHIMSEN QuEChERS dSPE Tube II , 15mL, 150mg PSA, 15mg GCB, 8850mg MgSO ₄ 50/P	Vegetables, fruits, mushrooms and sugars with high pigment content
		380-00129	SHIMSEN QuEChERS dSPE Tube III , 15mL, 400mg C18, 400mg PSA, 1200mg MgSO ₄ 50/P	Grains, oil crops and nuts
		380-00145	SHIMSEN QuEChERS dSPE Tube IV , 15mL, 400mg PSA, 400mg C18, 200mg GCB, 1200mg MgSO ₄ , 50/P	Tea and spices
	GC Column	221-75777-30	SH-1701, 30 m × 0.25 mm × 0.25 μm	--
	Standards	380-03388	SHIMSEN PESTICIDE MIX for GB 23200.113-2018, 50ppm	--
Accessory	GC Column	221-75954-30	SH-I-5Sil MS, 30 m × 0.25 mm × 0.25 μm	Method Optimization
	Liner, Ultra Inert	RT-23336	Splitless Single Taper Splitless Single Taper w/Wool 5-pk	--
	CONNECTER	221-38102-91	PRESS-TIGHT CONNECTER 5/PKT	--
	Guard Column	221-38102-91	SH-I Guard Column, 5m×0.25mm	--

Method: GB 23200.112-2018**Determination of 9 Carbamate Pesticides and Metabolites Residues in Mushroom (HPLC, LC-281 & SOP-021-038)**

- ShimNex HE C8 LC Column (5 μ m, 4.6 $\times$ 250 mm, PN: 380-01241-09)
- SHIMSEN Styra NH2 SPE Cartridge, 500 mg / 6 mL (PN: 380-00861-02)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μ m (PN: 380-00341)

Sample Preparation (SPE Method)**Analysis Condition**

Instrument: Shimadzu Essentia Carbamate Pesticides Analysis System

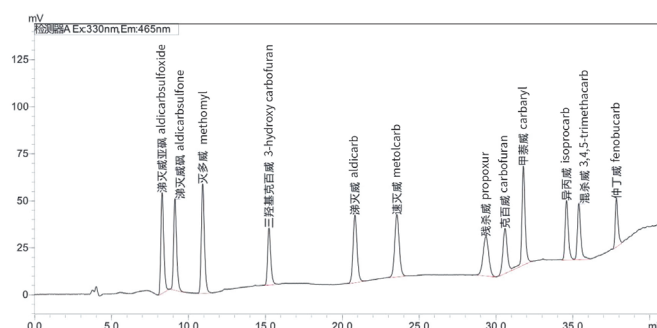
LC Column: ShimNex HE C8 (5 μ m, 4.6 $\times$ 250 mm, PN: 380-01241-09)

HPLC Condition

Column Temperature: 30 °C ; Hydrolysis temperature: 100 °C ;
 Derivatization Reagent 1: OPA Solution** ; Derivatization Reagent 2:
 0.05 mol/L NaOH Solution; Derivatization Reagent 1 Flow Rate: 0.3 mL/min;
 Derivatization Reagent 2 Flow Rate: 0.3 mL/min;
 Detector: Excitation Wavelength 330 nm; Emission Wavelength 465 nm;

Flow Rate: 1.0 mL/min; Injection volume: 10 μ L

Mobile Phase A: Water; Mobile Phase B: Methanol



LC Chromatogram of 9 Carbamate Pesticides and Metabolites Residues Standard Mixture Solution (Concentration: 100 ng/mL)

Gradient Program

Time (Min)	0	4	6	24	24.1	29	33	35	35.1	37	37.1	60
A (%)	85	75	60	60	40	40	20	20	0	0	85	85
B (%)	15	25	40	40	60	60	80	80	100	100	15	15

*Methanol - Dichloromethane Solution (1: 99 by Vol.):

Add 10 mL methanol to 990 mL dichloromethane and mix.

**OPA Solution (Derivatization Reagent 1):

Weigh 50 mg o-phthalaldehyde, CAS NO.: 643-79-8, dissolve in 5 mL methanol, mix as part A; weigh 1 g 2-dimethylaminoethanethiol hydrochloride, CAS NO.: 13242-44-9, dissolve in 5 mL sodium tetraborate decahydrate solution (CAS NO.: 1303-96-4, concentration: 4 g/L), mix as part B;

Mix part A, part B and 490 mL sodium tetraborate decahydrate solution (CAS NO.: 1303-96-4, concentration: 4 g/L).

Method: SN/T 1923-2007

Determination of glyphosate and its metabolite AMPA in tea and rice by derivatization method (LC-MS/MS, SGLC-LCMS-035)

- Shim-pack GISS-HP C18 (Metal free, 150×2.1 mm, 3 μm, PN: 227-30924-03)
- SHIMSEN Styra MCX, 500 mg/12 mL (PN: 380-00853-03)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μm (PN: 380-00341)

Sample Preparation (SPE Method)

● Extraction & Cleanup

Weigh 1 g sample, add 10 mL water and 10 mL dichloromethane, vortex for 1min, sonicate for 20 min, centrifuge at 8000 rpm for 5min

Take 5 mL supernatant for cleanup

Condition: 10 mL methanol followed by 10 mL water

1st Load: 3 mL prepared sample solution, discard the effluent
2nd Load: 2 mL prepared sample solution, collect the effluent

Vortex for derivatization

● Derivatization

Transfer 500 μL eluent into a PP tube, add 200 μL 5% borate solution

Vortex for 1min

Add 300 μL FMOC-Cl solution

Vortex for 1min

Derive at room temperature overnight

Filtrate with a 0.22 μm filter for analysis

- ★ Load the sample for two times to ensure the accurate concentration
- ★ Vortex thoroughly after adding the 5% borate solution to ensure better derivation
- ★ Recommend to use polypropylene tubes and vials to ensure the recovery rate

Analysis Condition

Instrument: LC-30AD + LCMS-8050

LC Column: Shim-pack GISS-HP C18[Metal free] (150×2.1 mm, 3 μm, PN: 227-30924-03)

UHPLC conditions

Flow Rate: 0.3 mL/min; Column Temperature: 40 °C ; Injection Volume: 5 μL;

Mobile Phase A: 5 mmol/L ammonium acetate in water;

Mobile Phase B: Acetonitrile;

MS Condition

Electron Ionization Mode: ESI + ; Scan Mode: MRM;

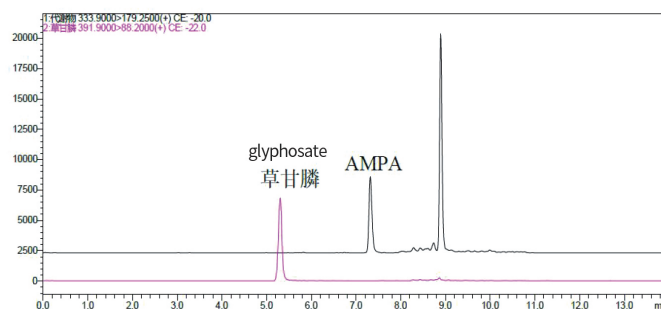
Heating block temp.: 400°C ; Interface temp.: 300 °C ; DL temp.: 250 °C ; Collision Gas: Ar;

Heating gas flow: N₂, 10.0 L/min; Drying gas flow: N₂, 10.0 L/min;

Nebulizing gas flow: N₂, 3.0 L/min;

Gradient Program

Time (Min)	0	6	7.01	9	9.01	14
A (%)	92	65	5	5	92	92
B (%)	8	35	95	95	8	8

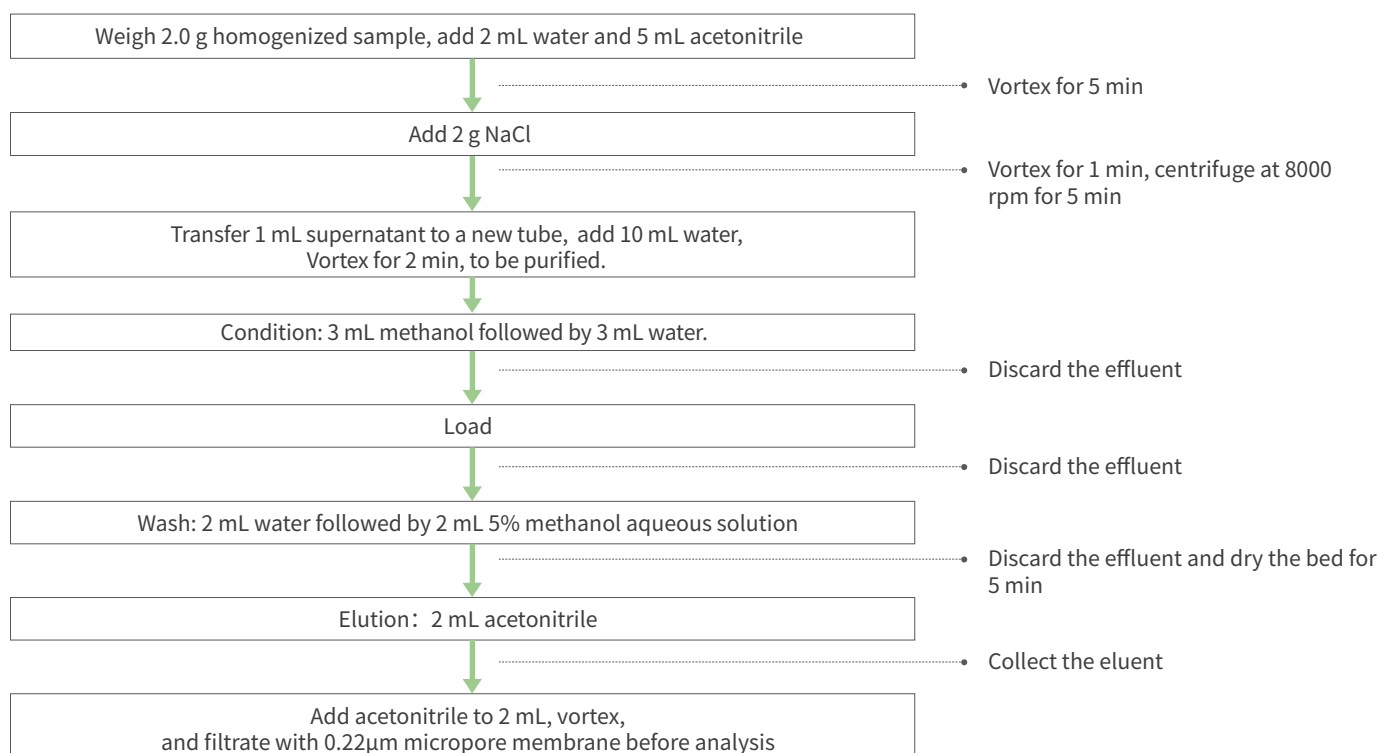


LC Chromatogram of 9 Carbamate Pesticides and Metabolites Residues Standard Mixture Solution (Concentration: 100 ng/mL)

Compound	Precursor Ion(m/z)	Product Ion(m/z)	Q1 Pre Bias	CE	Q3 Pre Bias
Glyphosate	391.9	179.2	-15	-22	-15
	391.9	88.0*	-14	-22	-30
Aminomethylphosphonic Acid, AMPA	333.9	179.2*	-16	-20	-16
	333.9	112.3	-10	-14	-18

Method: GB 23200.115-2018**Determination of Fipronil and Metabolites Residues in Egg (LC-MS/MS, SGLC-LCMS-020)**

- Shim-pack GIST C18 LC Column (50 × 2.1 mm, 1.9μm, PN: 227-30001-02)
- SHIMSEN Styra HLB, 60 mg / 3 mL (PN: 380-00855-03)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μm(PN: 380-00341)

Sample Preparation (SPE Method)**Analysis Condition**

Instrument: Shimadzu LC-30 AD + LCMS-8050

LC Column: Shim-pack GIST C18(50mm x 2.1mm, 1.9μm, PN: 227-30001-02)

HPLC Condition

Column Temperature: 40 °C ; Flow Rate: 0.4 mL/min; Injection volume: 0.2 μL

Mobile Phase A: 1 mM Ammonium Acetate Aqueous Solution;

Mobile Phase B: Methanol

Gradient Program

Time (Min)	0	1.5	2.5	2.51	4
A (%)	25	5	5	25	25
B (%)	75	95	95	75	75

MS Condition

Electron Ionization Mode: ESI — ; Heating block temp.: 400°C ; Interface temp.: 300 °C ; DL temp.: 250 °C ; Collision Gas: Ar; Heating gas flow: N₂ , 10.0 L/min; Drying gas flow: N₂ , 10.0 L/min; Nebulizing gas flow: N₂ , 3.0 L/min; Scan Mode: MRM; Please check the MRM parameters in GB 23200.115-2018 method.

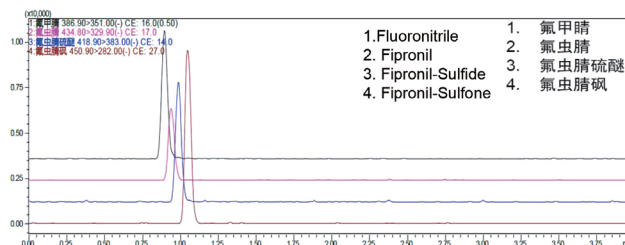


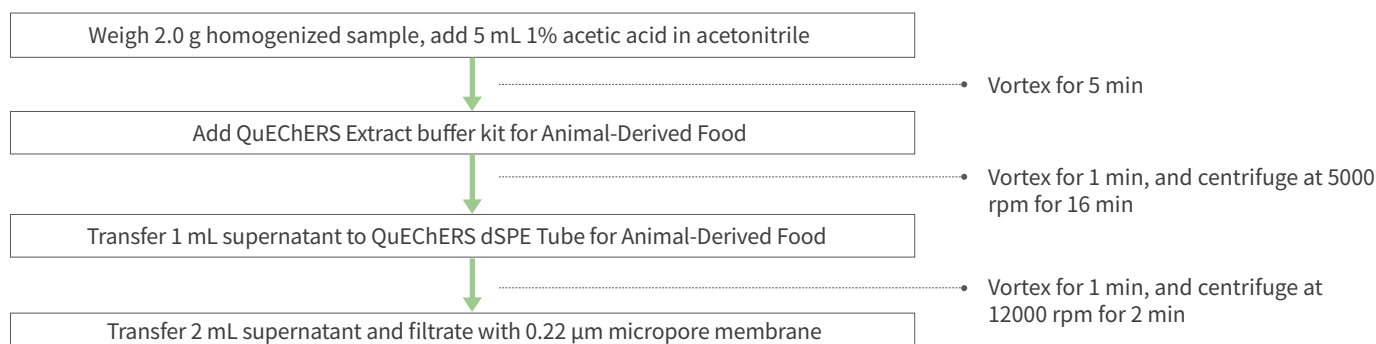
Fig. MRM Chromatogram of Fipronil and Metabolites Standard Mixture Solution (Concentration: 1 ng/mL)

Method: GB 23200.115-2018

Determination of Fipronil and Metabolites Residues in Egg (LC-MS/MS, SGLC-LCMS-019)

- Shim-pack GIST C18 LC Column (50 × 2.1 mm, 1.9μm, PN: 227-30001-02)
- SHIMSEN QuEChERS for Animal-Derived Food (380-00112, 380-00155)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 μm(PN: 380-00341)

Sample Preparation (QuEChERS Method)



Analysis Condition

Instrument: Shimadzu LC-30 AD + LCMS-8050

LC Column: Shim-pack GIST C18(50mm x 2.1mm, 1.9μm, PN: 227-30001-02)

HPLC Condition

Column Temperature: 40 °C ; Flow Rate: 0.4 mL/min; Injection volume: 0.2 μL

Mobile Phase A: 1 mM Ammonium Acetate Aqueous Solution;

Mobile Phase B: Methanol

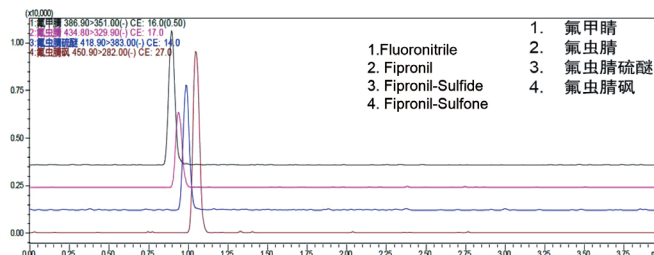


Fig. MRM Chromatogram of Fipronil and Metabolites Standard Mixture Solution (Concentration: 1 ng/mL)

Gradient Program

Time (Min)	0	1.5	2.5	2.51	4
A (%)	25	5	5	25	25
B (%)	75	95	95	75	75

MS Condition

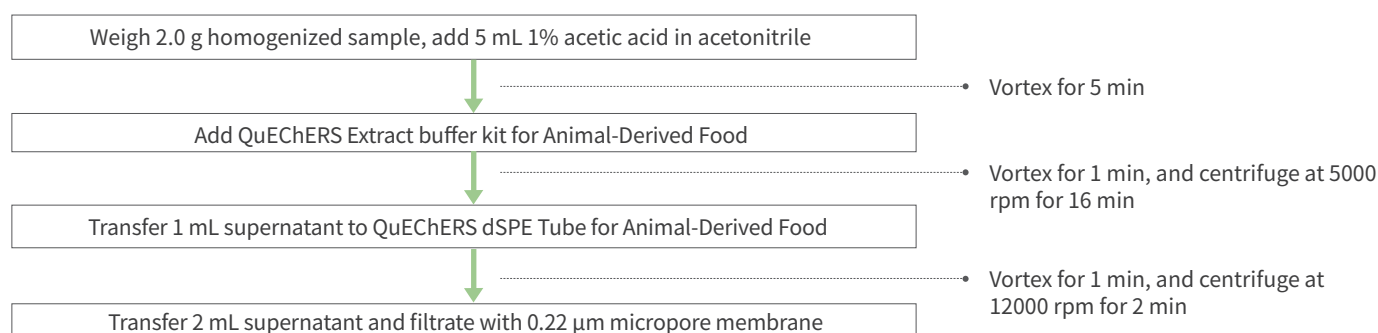
Electron Ionization Mode: ESI — ; Heating block temp.: 400°C ; Interface temp.: 300 °C ; DL temp.: 250 °C ; Collision Gas: Ar; Heating gas flow: N₂ , 10.0 L/min; Drying gas flow: N₂ , 10.0 L/min; Nebulizing gas flow: N₂ , 3.0 L/min;

Scan Mode: MRM; Please check the MRM parameters in the table below.

Compound	Precursor Ion(m/z)	Product Ion(m/z)	Q1 Pre Bias	CE	Q3 Pre Bias
Fipronil-desulfinyl	386.9	351.0	19	16	17
	386.9	282.0	19	31	19
Fipronil	434.8	329.0	21	17	16
	434.8	249.9	21	28	17
Fipronil-sulfide	418.9	383.0	21	14	18
	418.9	261.8	21	28	17
Fipronil-sulfone	450.9	282.0	22	27	13
	450.9	415.0	22	17	20

Method: GB 23200.115-2018**Determination of Fipronil and Metabolites in Egg by SHIMSEN QuEChERS and GC-MS/MS (GCMSMS-119)**

- SH-I-5Sil MS GC Column (30 m × 0.25 mm, 0.25µm, PN: 221-75954-30)
- SHIMSEN QuEChERS for Animal-Derived Food (380-00112, 380-00155)
- SHIMSEN Arc Disc Hydrophilic PTFE, 13 mm, 0.22 µm(PN: 380-00341)

Sample Preparation (QuEChERS Method)**Analysis Condition****Instrument:** GCMS-TQ8050**GC Column:** SH-I-5Sil MS (30 m × 0.25 mm, 0.25µm, PN: 221-75954-30)**GC conditions**

Column oven temp.: 50 °C (1 min), 25 °C/min to 125 °C (0 min), 10 °C/min to 300 °C (0.5 min);

Carrier gas: He, 47.2 cm/sec (constant linear velocity mode);

Injector temp.: 250 °C; Injection mode: Splitless (1 min); Injection volume: 1 µL;

High pressure injection: 250 kPa

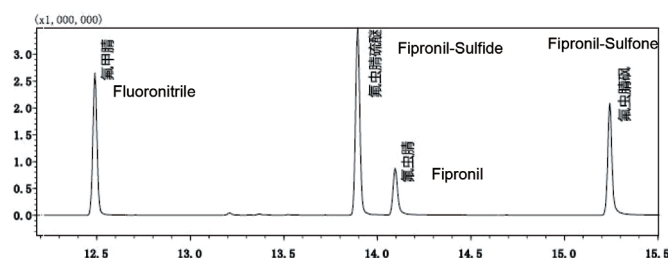


Fig. MRM Chromatogram of Fipronil and Metabolites Standard Mixture Solution (Concentration: 100 ng/mL)

MS Condition

Ion source temperature: 200 °C; Interface temperature: 250 °C

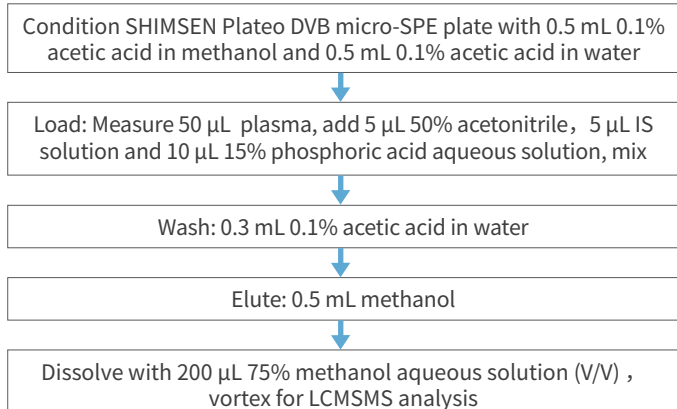
Scan Mode: MRM; Please check the MRM parameters in GB 23200.113-2018 method

Compound	Ret. Time	Quantitative Ions (m/z)	CE(V)	Qualitative ions 1 (m/z)	CE(V)	Qualitative ions 2 (m/z)	CE(V)
Fipronil-desulfinyl	12.475	387.95>332.90	18	333.00>231.00	27	333.00>281.00	15
Fipronil-sulfide	13.855	350.95>255.00	18	419.95>350.90	15	419.95>254.90	33
Fipronil	14.080	366.90>212.90	30	368.90>214.90	30	366.90>254.90	22
Fipronil-sulfone	15.210	382.95>255.00	24	382.95>213.00	36	382.95>241.00	12

Determination of enalapril and Enalaprilat in plasma

- Shim-pack sceptor C18-120(50mm x 2.1mm, 1.9 μ m, PN: 227-31012-03)
- SHIMSEN Plateo DVB micro-SPE plate, 2mg-700 μ L/well, 1/pkg (P/N: 380-00841-31)

Samle preparation procedure



Conditions

Equipment: Shimadzu LC-30AD + LCMS-8060

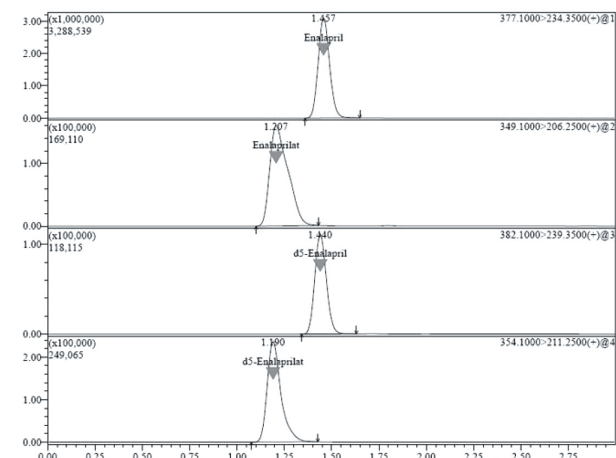
Column: Shim-pack sceptor C18-120(50mm x 2.1mm, 1.9 μ m, PN: 227-31012-03)

Column temperature: 35 $^{\circ}$ C Flow rate: 0.4 mL/min Injection volume: 5 μ L

Mobile phase: A: 80% methanol aqueous solution (0.5% formic acid)
B: Water (0.5% formic acid)

Gradient:

Time(Min)	Modulee	Commande	Value (%)
0.01	Pumps	B.Conc	37.5
1.00	Pumps	B.Conc	100
2.00	Pumps	B.Conc	100
2.10	Pumps	B.Conc	37.5
3.00	Controller	Stop	--



MRM chromatogram of mixed standard solution of enalapril and enalaprilat





**Shimadzu (Shanghai) Global Laboratory
Consumables Co.,Ltd.**
www.sglc.shimadzu.com.cn
www.shimadzumall.com
Contact: contact@sglc.shimadzu.com.cn

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