

roQ
QuEChERS Kits

A Quicker and Easier

Sample Preparation Choice



FOOD AND ENVIRONMENTAL ANALYSIS

phenomenex
...breaking with traditionSM

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QuEChERS

1

What is QuEChERS?

QuEChERS is a Sample Preparation Technique for:

- Complex sample matrices
- Wide range of compounds (typically pesticides)
- Food and environmental samples

2

What does it stand for?

“Quick Easy Cheap Effective Rugged Safe” (QuEChERS)

3

How does it help me?

QuEChERS is a simplified 2 step sample preparation process that:

- Significantly reduces sample preparation time
- Is simple, inexpensive, and easy to use
- And is effective and rugged at extracting and cleaning samples for a wide range of compounds

For more details visit
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Table of Contents

How Does roQ QuEChERS Work?..... p. 4

Choose Your roQ QuEChERS Kits p. 5

Fast and Easy Food Applicationspp. 6 - 9

Reliable Environmental Applications..... pp. 10 - 11

Ordering Information pp. 12 - 13

 roQ QuEChERS.....p. 12

 HPLC/UHPLC Columns.....p. 13

roQ QuEChERS Resources and Toolsp. 14

GC Column Selection and Resources.....p. 15



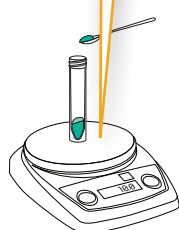
How Does roQ™ QuEChERS Work?

STEP 1

Extraction*



Blend fruits or vegetables to be analyzed.



Easily Weigh Out Samples

Weigh blended sample.

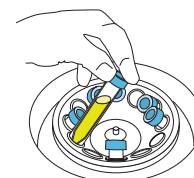


No Mess Salt Packets

Add salts and acetonitrile.



Shake tube for 1 minute.



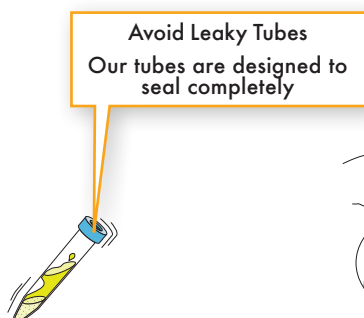
Centrifuge tube for 5 minutes.

STEP 2

Clean Up/dSPE**

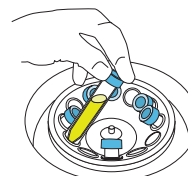


Add supernatant from extraction procedure into a roQ dSPE tube.



Avoid Leaky Tubes
Our tubes are designed to seal completely

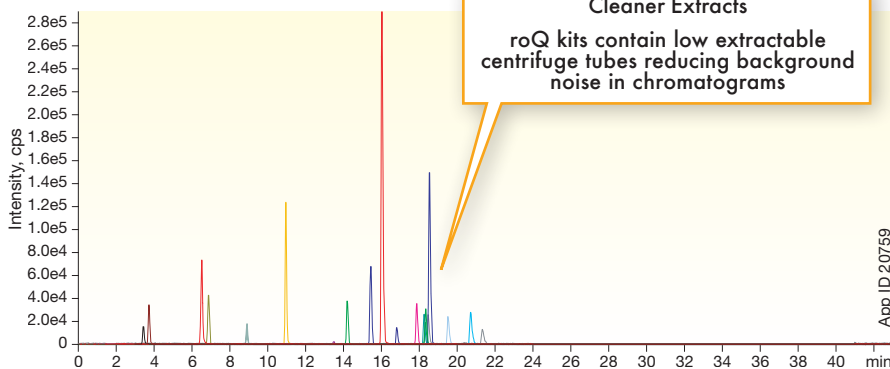
Shake dSPE tube for 30 seconds.



Centrifuge dSPE tube for 5 minutes.

STEP 3

Analysis by GC or HPLC



*All roQ Extraction kits contain fifty easy-pour salt packets and fifty 50 mL stand-alone centrifuge tubes.

**All roQ dSPE kits contain pre-weighed sorbents/salts inside 2 mL or 15 mL centrifuge tubes.



Salts and Sorbents used in roQ Kits

Extraction:

- Magnesium Sulfate(MgSO₄)
- Sodium Acetate(NaOAc)
- Sodium Chloride(NaCl)
- Sodium Citrate Tribasic Dihydrate(SCTD)
- Sodium Citrate Dibasic Sesquihydrate(SCDS)

Clean Up/dSPE:

- Magnesium Sulfate (MgSO₄)
- Primary/Secondary Amine (PSA)
- Endcapped C18 Sorbent (C18E)
- Graphitized Carbon Black (GCB)

Choose Your Kit



STEP 1

Extraction*

AOAC

AOAC 2007.01 Method
6.0 g MgSO₄, 1.5 g NaOAc
KSO-8911

ORIGINAL






Non-Buffered Method
4.0 g MgSO₄, 1.0 g NaCl
KSO-8910
6.0 g MgSO₄, 1.5 g NaCl
KSO-8912

EN

EN 15662 Method
4.0 g MgSO₄, 1.0 g NaCl,
1.0 g SCTD, 0.5 g SCDS
KSO-8909

STEP 2

Clean Up/dSPE**

	AOAC 2007.01		EN 15662	
	1 mL	8 mL	1 mL	6 mL
General 	150 mg MgSO ₄ 50 mg PSA KSO-9511	1200 mg MgSO ₄ 400 mg PSA KSO-9515	150 mg MgSO ₄ 25 mg PSA KSO-9503	900 mg MgSO ₄ 150 mg PSA KSO-9507
Fats and Waxes 	150 mg MgSO ₄ 50 mg PSA 50 mg C18E KSO-9512	1200 mg MgSO ₄ 400 mg PSA 400 mg C18E KSO-9516	150 mg MgSO ₄ 25 mg PSA 25 mg C18E KSO-9504	900 mg MgSO ₄ 150 mg PSA 150 mg C18E KSO-9508
Pigmented 	150 mg MgSO ₄ 50 mg PSA 50 mg GCB KSO-9513	1200 mg MgSO ₄ 400 mg PSA 400 mg GCB KSO-9517	150 mg MgSO ₄ 25 mg PSA 2.5 mg GCB KSO-9505	900 mg MgSO ₄ 150 mg PSA 15 mg GCB KSO-9509
Highly Pigmented 	—	—	150 mg MgSO ₄ 25 mg PSA 7.5 mg GCB KSO-9506	900 mg MgSO ₄ 150 mg PSA 45 mg GCB KSO-9510
Pigments and Fats 	150 mg MgSO ₄ 50 mg PSA 50 mg GCB 50 mg C18E KSO-9514	1200 mg MgSO ₄ 400 mg PSA 400 mg GCB 400 mg C18E KSO-9518	—	—

GC



LC



*All roQ Extraction kits contain fifty easy-pour salt packets and fifty 50 mL stand-alone centrifuge tubes.
**All roQ dSPE kits contain pre-weighed sorbents/salts inside 2 mL or 15 mL centrifuge tubes.

Food Applications

Multi-Residue Pesticides Screening: Fruits and Vegetables

Easily Prepare Samples with roQ QuEChERS Kits

STEP 1

Extraction



EN 15662 Method

4.0 g MgSO₄, 1.0 g NaCl,
1.0 g SCTD, 0.5 g SCDS
KSO-8909

STEP 2

Clean up/dSPE



EN 15662 Method

15 mL dSPE Kits
900 mg MgSO₄, 150 mg PSA
KSO-9507

Column: Synergi 2.5 µm Fusion-RP 100 Å

Dimensions: 50 x 2.0mm

Part No.: 00B-4423-B0

SecurityGuard™: AJ0-4286

Mobile Phase: A: Water/Methanol (90:10) +
5mm Ammonium formate
B: Methanol/Water (90:10) +
5mm Ammonium formate

Gradient:	Time (min)	% B
	0	0
	1	0
	15	100
	18	100
	18.05	0
	20	0

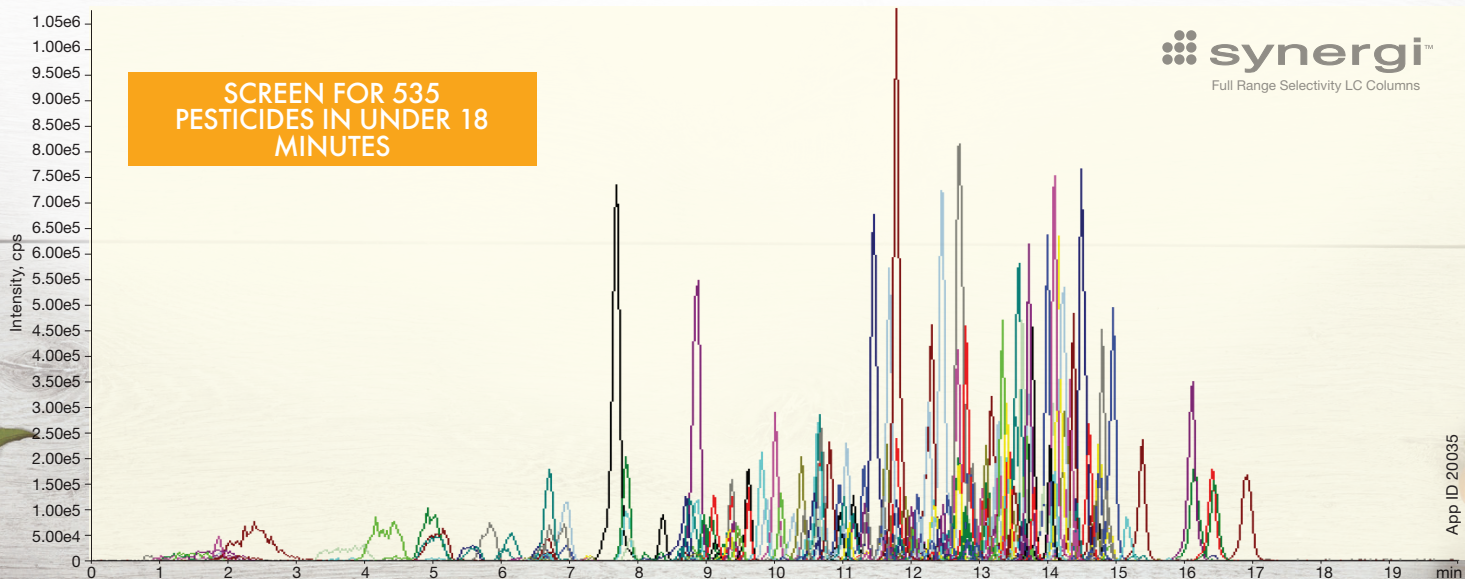
Flow Rate: 0.4 mL/min

Temperature: 40 °C

Detection: MS/MS (SCIEX API 3200™)

Sample: Pesticide mix

Fully Porous LC-MS/MS Option



Food Applications

STEP 1

Extraction



EN 15662 Method

4.0 g MgSO₄, 1.0 g NaCl,
1.0 g SCTD, 0.5 g SCDS
KSO-8909

STEP 2

Clean up/dSPE



EN 15662 Method

15 mL dSPE Kits
900 mg MgSO₄, 150 mg PSA
KSO-9507

Column: Kinetex 5 μm Biphenyl 100 Å

Dimensions: 100 x 2.1 mm

Part No.: 00D-4627-AN

SecurityGuard™ ULTRA: AJ0-9209

Mobile Phase: A: 5 mM Ammonium formate in Water
B: 5 mM Ammonium formate in Methanol

Gradient:	Time (min)	% B
	0.01	10
	1	10
	10	90
	15	90
	15	10
	20	10

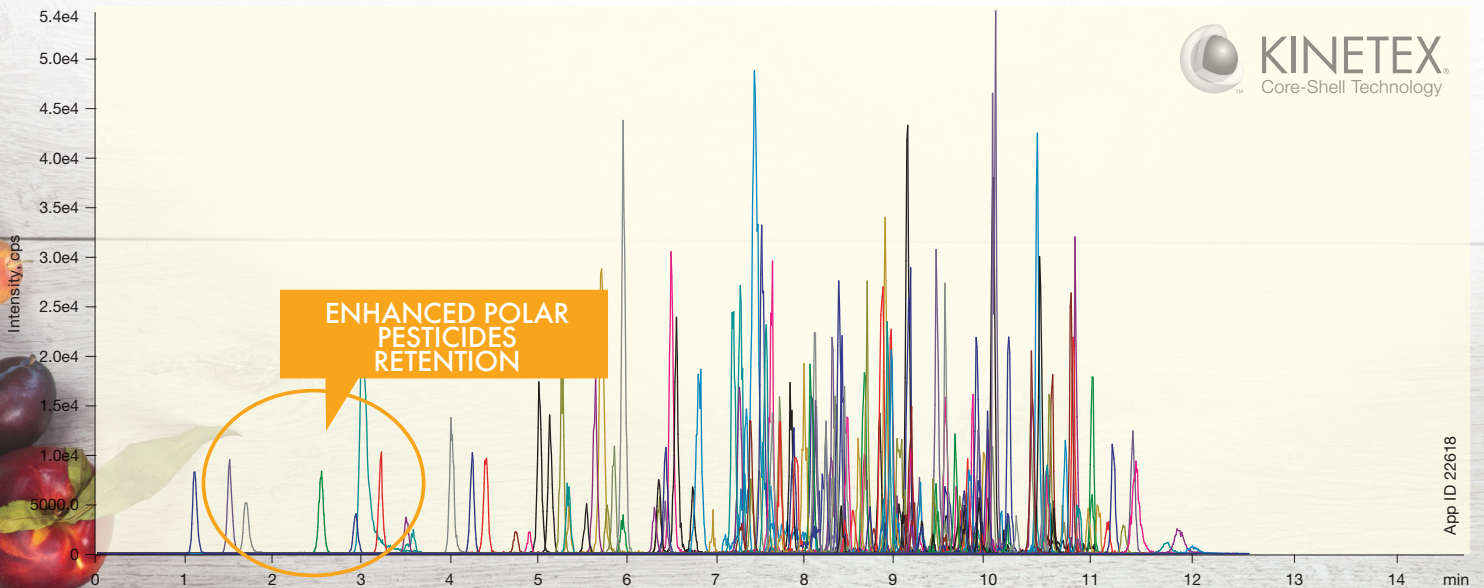
Flow Rate: 0.5 mL/min

Temperature: 35 °C

Detection: MS/MS (SCIEX 4500 QTRAP®)

Sample: 175+ Pesticide mix

Core-Shell LC-MS/MS Option



Food Applications

Mycotoxins Screening: Grains

Easily Prepare Samples with roQ QuEChERS Kits

STEP 1

Extraction



EN 15662 Method

4.0 g MgSO₄, 1.0 g NaCl,
1.0 g SCTD, 0.5 g SCDS
KSO-8909

STEP 2

Clean up/dSPE



EN 15662 Method

15 mL dSPE Kits
900 mg MgSO₄, 150 mg PSA
KSO-9507

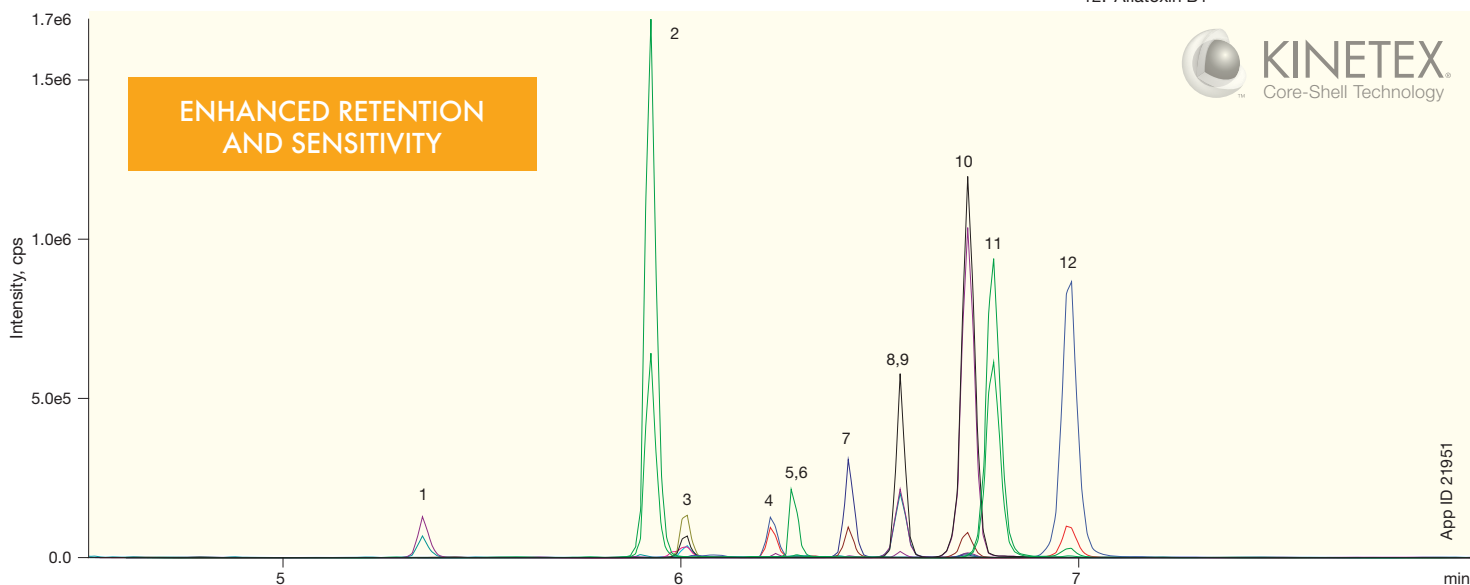
Column: Kinetex 2.6 µm Biphenyl
Dimensions: 50 x 2.1 mm
Part No.: 00B-4622-AN
SecurityGuard™ ULTRA: AJ0-9209
Mobile Phase: A: 5 mM Ammonium acetate with 0.1% Acetic acid
B: Methanol with 5 mM Ammonium acetate with 0.1% Acetic acid
Gradient:

Time (min)	% B
0	2
2	2
5	80
5.2	98
8	98
8.01	2
11	2

Flow Rate: 0.45 mL/min
Temperature: Ambient
Detection: MS/MS (SCIE X API 4000™)
Sample:

- 15-Acetyldeoxynivalenol
- DAS
- FB1
- HT2 Toxin
- FB2
- T2 Toxin
- Aflatoxin M1
- Aflatoxin G2
- Ochratoxin A
- Aflatoxin G1
- Aflatoxin B1
- Aflatoxin B2

Analytical Column: Kinetex Core-Shell 2.6 µm Biphenyl



Antibiotics Analysis: Meat and Animal Tissues

Easily Prepare Samples with roQ QuEChERS Kits

STEP 1

Extraction



AOAC 2007.01 Method
6.0 g MgSO₄, 1.5 g NaOAc
KSO-8911

STEP 2

Clean up/dSPE



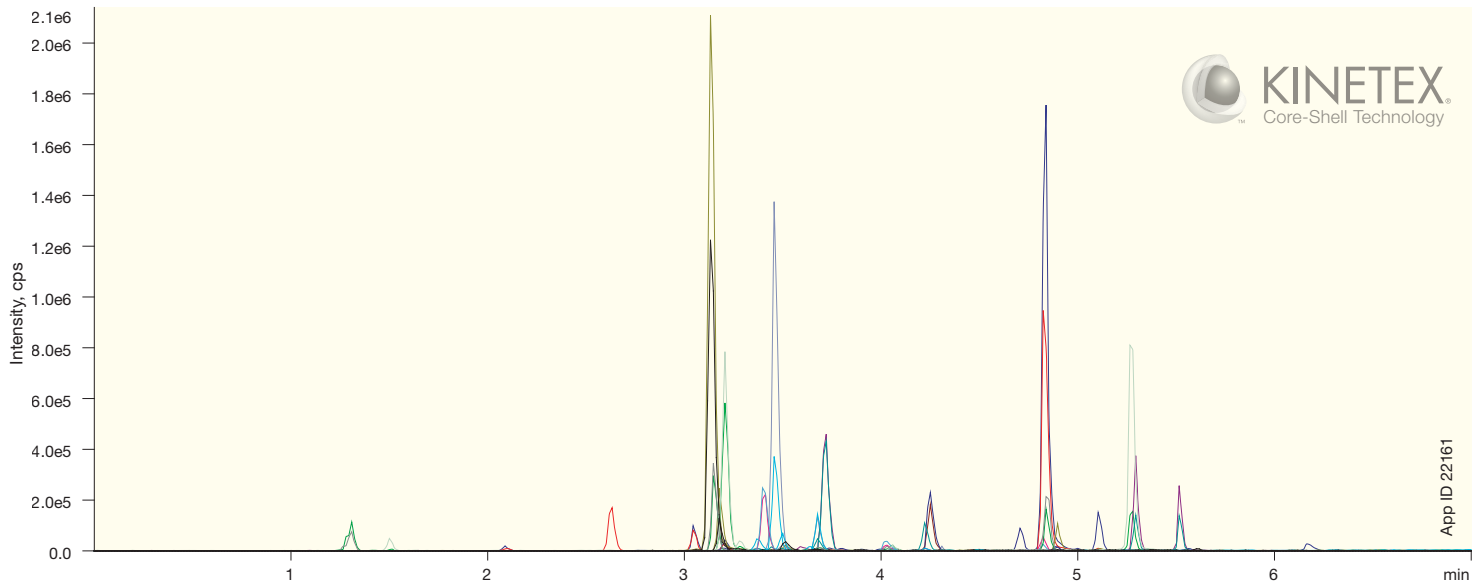
15 mL dSPE Kits
900 mg MgSO₄, 150 mg PSA,
150 mg C18E
KSO-9508

Column: Kinetex 2.6µm Biphenyl 100Å
Dimensions: 50 x 2.1 mm
Part No.: 00B-4622-AN
SecurityGuard™ ULTRA: AJ0-9209
Mobile Phase: A: Water with 0.1 % Formic acid
B: Methanol with 0.1 % Formic acid
Gradient:

Time (min)	% B
0	0
5	100
7	100

Flow Rate: 0.5 mL/min
Temperature: Ambient
Detection: MS/MS (SCIEX API 4500 QTRAP®)
Sample: 41 Antibiotics

Analytical Column: Kinetex Core-Shell 2.6 µm Biphenyl



Environmental Applications

Hormones: Marine & Fresh Water Sediment

Modified roQ QuEChERS Protocol

STEP 1

Extraction

1. Weigh 2 g of dry sediment into a 50 mL centrifuge
2. Spike sample with internal standards
3. Add 10 mL of reagent water and mix
4. Add 10 mL of acidified acetonitrile (0.1% acetic acid) and shake for 10 seconds
5. Add sodium acetate (1.5 g) and $MgSO_4$ (2.0 g), or weigh out 3.5 g of AOAC 2007.01 roQ extraction packet (**AHO-9043**)
6. Shake for 10 seconds and vortex for 1 minute
7. Centrifuge at 4000 rpm for 5 min
8. Cool sample at $-20\text{ }^\circ\text{C}$ for 1.5 hours or until frozen

STEP 2

Clean-up

1. Take 8-9 mL of the supernatant from the previous step and transfer to a 15 mL dSPE tube (**KSO-9516**)
2. Shake for 10 seconds and vortex for 1 minute
3. Centrifuge for 10 minutes at 3000 rpm
4. Aspirate 5 mL of supernatant and filter using a Phenex™ 0.2 μm PTFE filter (**AFO-2202-12**) into a test tube suitable for a dry-down station
5. Evaporate sample using a dry-down station at $\leq 35\text{ }^\circ\text{C}$ to near dryness
6. Reconstitute by first adding 50 μL of acetone, vortexing, and then adding 950 μL of methanol/water (1:1)
7. Transfer the reconstituted sample to an autosampler vial for analysis

Column: Kinetex 2.6 μm XB-C18
Dimensions: 50 x 2.1 mm
Part No.: 00B-4496-AN
SecurityGuard™ ULTRA: 00B-4622-AN

Mobile Phase: A: Water
B: Acetonitrile

Gradient:

Time (min)	% B
0	15
1	20
7.25	60
8	80
9.50	80
9.55	15
14	15

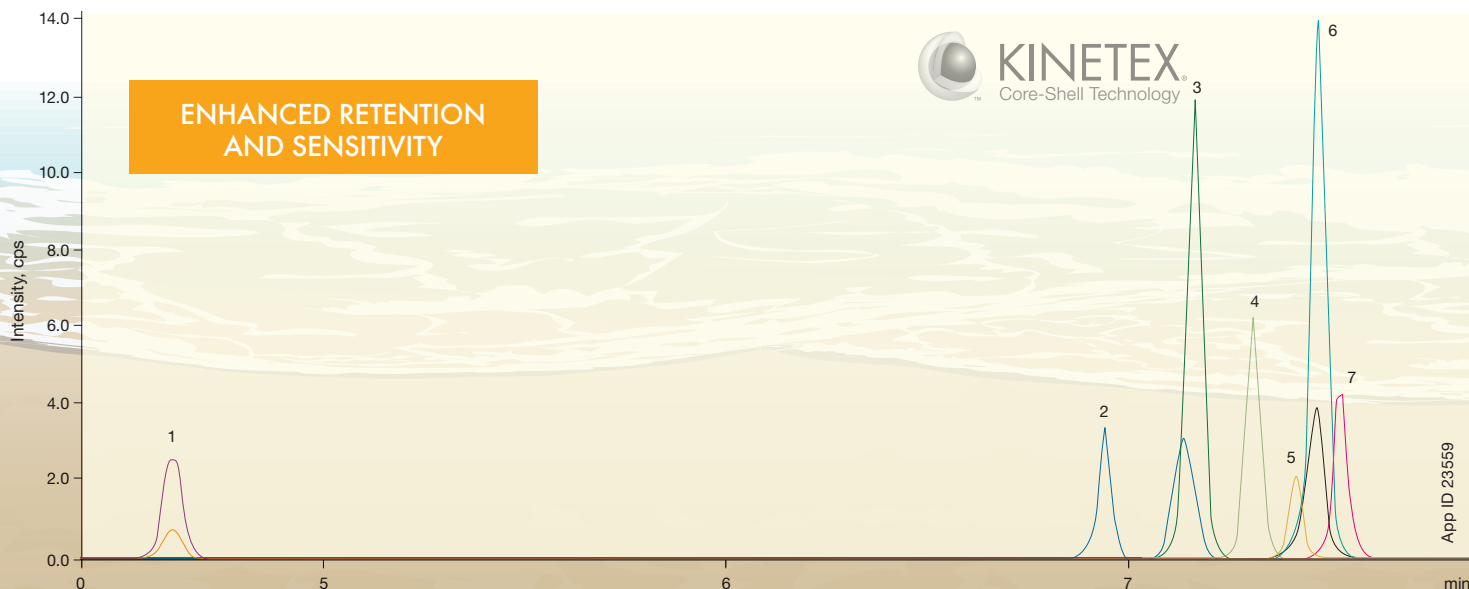
Injection: 12 μL
Flow Rate: 0.5 mL/min
Temperature: 30 $^\circ\text{C}$
Detection: MS/MS (SCIEX 5500 QTRAP® ESI+, ESI-)

Sample:

1. Estriol (E3)
2. 17- β Estradiol (E2)
3. Testosterone (TEST)
4. Equilin (EQ)
5. 17- α -Ethinylestradiol (EE2)
6. Estrone (E1)
7. Androstenedione (AND)

Note: Post column infusion with 0.05 % NH_4OH

Analytical Column: Kinetex 2.6 μm XB-C18



Pyrethroids: Marine & Fresh Water Sediment

Modified roQ QuEChERS Protocol

STEP 1

Extraction

1. Weigh 2 g of dry sediment into a 50 mL centrifuge
2. Spike sample with internal standards
3. Add 10 mL of reagent water and mix
4. Add 10 mL of acidified acetonitrile (0.1% acetic acid) and shake for 10 seconds
5. Add sodium acetate (1.5 g) and $MgSO_4$ (2.0 g), or weigh out 3.5 g of AOAC 2007.01 roQ extraction packet (**AHO-9043**)
6. Shake for 10 seconds and vortex for 1 minute
7. Centrifuge at 4000 rpm for 5 min
8. Cool sample at $-20\text{ }^\circ\text{C}$ for 1.5 hours or until frozen

STEP 2

Clean-up

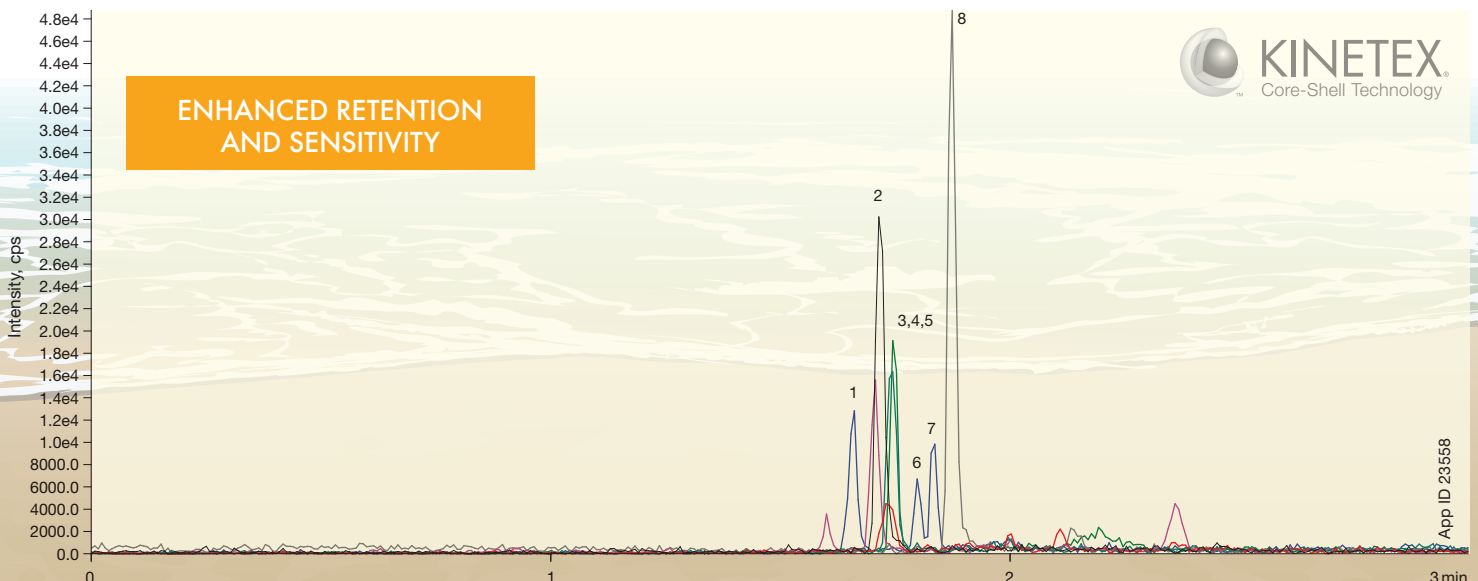
1. Take 8-9 mL of the supernatant from the previous step and transfer to a 15 mL dSPE tube (**KSO-8926**)
2. Shake for 10 seconds and vortex for 1 minute
3. Centrifuge for 10 minutes at 3000 rpm
4. Aspirate 5 mL of supernatant and filter using a Phenex™ 0.2 μm PTFE filter (**AFO-2202-12**) into a test tube suitable for a dry-down station
5. Evaporate sample using a dry-down station at $\leq 35\text{ }^\circ\text{C}$ to near dryness
6. Reconstitute by first adding 50 μL of acetone, vortexing, and then adding 950 μL of methanol/water (1:1)
7. Transfer the reconstituted sample to an autosampler vial for analysis

Column: Kinetex 2.6 μm EVO C18
Dimensions: 50 x 2.1 mm
Part No.: 00B-4725-AN
SecurityGuard™ ULTRA: AJ0-9298
Mobile Phase: A: 5mM Ammonium acetate
B: Methanol

Gradient:	Time (min)	% B
	1	50
	2	95
	3	95

Injection: 5 $\mu\text{L}/\text{min}$
Flow Rate: 0.7 mL/min
Temperature: 22 $^\circ\text{C}$
Detection: MS/(SCIEX Triple Quad™ 4500)
Sample:
1. Cyfluthrin
2. Cyhalothrin
3. Cypermethrin
4. Delatmethrin
5. Esfenvalerate
6. cis-Permethrin
7. trans-Permethrin
8. Bifenthrin

Analytical Column: Kinetex 2.6 μm EVO C18



Ordering Information

roQ Extraction Kits

Extraction kits contain fifty easy-pour salt packets and fifty 50 mL stand-alone centrifuge tubes

Description	Unit	Part No.
AOAC 2007.01 Method Extraction Kits		
6.0 g MgSO ₄ , 1.5 g NaOAc	50/pk	KSO-8911*
EN 15662 Method Extraction Kits		
4.0 g MgSO ₄ , 1.0 g NaCl, 1.0 g SCTD, 0.5 g SCDS	50/pk	KSO-8909*
Original Non-buffered Method Extraction Kits		
4.0 g MgSO ₄ , 1.0 g NaCl	50/pk	KSO-8910
6.0 g MgSO ₄ , 1.5 g NaCl	50/pk	KSO-8912

*AOAC and EN Extraction Kits also available in traditional non-collared 50 mL centrifuge tubes, Part No.: KSO-8911-NC and KSO-8909-NC

roQ dSPE Kits

dSPE kits contain pre-weighed sorbents/salts inside 2 mL or 15 mL centrifuge tubes

Description	Unit	Part No.
2 mL dSPE Kits		
150 mg MgSO ₄ , 25 mg PSA, 25 mg C18E	100/pk	KSO-9504
150 mg MgSO ₄ , 25 mg PSA, 2.5 mg GCB	100/pk	KSO-9505
150 mg, MgSO ₄ , 25 mg PSA, 7.5 mg GCB	100/pk	KSO-9506
150 mg MgSO ₄ , 25 mg PSA	100/pk	KSO-9503
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18E, 50 mg GCB	100/pk	KSO-9514
150 mg MgSO ₄ , 50 mg PSA, 50 mg C18E	100/pk	KSO-9512
150 mg MgSO ₄ , 50 mg PSA, 50 mg GCB	100/pk	KSO-9513
150 mg MgSO ₄ , 50 mg PSA	100/pk	KSO-9511
15 mL dSPE Kits		
900 mg MgSO ₄ , 150 mg PSA, 150 mg C18E	100/pk	KSO-9508
900 mg MgSO ₄ , 150 mg PSA, 15 mg GCB	100/pk	KSO-9509
900 mg MgSO ₄ , 150 mg PSA, 45 mg GCB	100/pk	KSO-9510
900 mg MgSO ₄ , 150 mg PSA	100/pk	KSO-9507
1200 mg MgSO ₄ , 400 mg PSA, 400 mg C18E, 400 mg GCB	100/pk	KSO-9518
1200 mg MgSO ₄ , 400 mg PSA, 400 mg C18E	100/pk	KSO-9516
1200 mg MgSO ₄ , 400 mg PSA, 400 mg GCB	100/pk	KSO-9517
1200 mg MgSO ₄ , 400 mg PSA	100/pk	KSO-9515

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Bulk roQ QuEChERS Sorbents

Phase	10 g	100 g
C18-E	—	04G-4348
GCB (Graphitized Carbon Black)	04D-4615	04G-4615
PSA	—	04G-4610

roQ Extraction Salt Packets

Salt packets only. Centrifuge tubes not included.

Description	Unit	Part No.
AOAC 2007.01 Method Extraction Packets		
6.0 g MgSO ₄ , 1.5 g NaOAc	50/pk	AHO-9043
EN 15662 Method Extraction Packets		
4.0 g MgSO ₄ , 1.0 g NaCl, 1.0 g SCTD, 0.5 g SCDS	50/pk	AHO-9041
Original Non-Buffered Method Extraction Packets		
4.0 g MgSO ₄ , 1.0 g NaCl	50/pk	AHO-9042
6.0 g MgSO ₄ , 1.5 g NaCl	50/pk	AHO-9044

roQ™
QuEChERS Kits



LC Ordering Information

Synergi™

Whether your pesticides are hydrophobic or polar, Synergi Fusion-RP columns provide you with a full range of selectivity ensuring separation of the most challenging and complex mixtures.

Synergi 2.5 µm High Speed Technology (HST) Columns (mm)

Phases	30 x 2.0	50 x 2.0	100 x 2.0	50 x 3.0	100 x 3.0	50 x 4.6
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Fusion-RP	00A-4423-B0	00B-4423-B0	00D-4423-B0	00B-4423-Y0	00D-4423-Y0	00B-4423-E0
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Synergi 4 µm Microbore and Minibore Columns (mm) SecurityGuard™ Cartridges (mm)

Phases	50 x 1.0	150 x 1.0	30 x 2.0	50 x 2.0	75 x 2.0	150 x 2.0	250 x 2.0	4 x 2.0*
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Fusion-RP	00B-4424-A0	00F-4424-A0	00A-4424-B0	00B-4424-B0	00C-4424-B0	00F-4424-B0	00G-4424-B0	AJO-7556
								10/pk for ID: 2.0-3.0 mm

Synergi 4 µm MidBore™ Columns (mm) SecurityGuard™ Cartridges (mm)

Phases	50 x 3.0	150 x 3.0	250 x 3.0	4 x 2.0*
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Fusion-RP	00B-4424-Y0	00F-4424-Y0	00G-4424-Y0	AJO-7556
				10/pk for ID: 2.0-3.0 mm

Synergi 4 µm Analytical Columns (mm) SecurityGuard™ Cartridges (mm)

Phases	50 x 4.6	75 x 4.6	150 x 4.6	250 x 4.6	4 x 2.0*
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Fusion-RP	00B-4424-E0	00C-4424-E0	00F-4424-E0	00G-4424-E0	AJO-7557
					10/pk for ID: 3.2-8.0 mm

*SecurityGuard Analytical Cartridges require holder, Part No.: KJO-4282

Learn more about Synergi columns at
www.phenomenex.com/synergi

Kinetex®

Get the most out of every HPLC/UHPLC analysis. Kinetex Core-Shell Technology produces increased efficiencies over traditional fully porous columns, yielding remarkable chromatographic resolution, higher peak capacities, and greater sensitivity.

Kinetex 5 µm Columns (mm) SecurityGuard ULTRA Cartridges (mm)

Phases	50 x 2.1		50 x 3.0		50 x 4.6		100 x 4.6		150 x 4.6		250 x 4.6	
	3/pk		3/pk		3/pk		3/pk		3/pk		3/pk	
EVO C18	00B-4633-AN	AJO-9298	00B-4633-Y0	AJO-9297	00B-4633-E0	00D-4633-E0	00F-4633-E0	00G-4633-E0	00F-4633-E0	00G-4633-E0	00F-4633-E0	AJO-9296
Biphenyl	00B-4627-AN	AJO-9209	00B-4627-Y0	AJO-9208	00B-4627-E0	00D-4627-E0	00F-4627-E0	00G-4627-E0	00F-4627-E0	00G-4627-E0	00F-4627-E0	AJO-9207
XB-C18	00B-4605-AN	AJO-8782	00B-4605-Y0	AJO-8775	00B-4605-E0	00D-4605-E0	00F-4605-E0	00G-4605-E0	00F-4605-E0	00G-4605-E0	00F-4605-E0	AJO-8768

for 2.1 mm ID

for 3.0 mm ID

for 4.6 mm ID

Kinetex 2.6 µm Columns (mm) SecurityGuard ULTRA Cartridges (mm)

Phases	50 x 2.1		150 x 2.1		50 x 3.0		50 x 4.6		100 x 4.6		150 x 4.6	
	3/pk		3/pk		3/pk		3/pk		3/pk		3/pk	
EVO C18	00B-4725-AN	00F-4725-AN	AJO-9298	00B-4725-Y0	AJO-9297	00B-4725-E0	00D-4725-E0	00F-4725-E0	00G-4725-E0	00F-4725-E0	00G-4725-E0	AJO-9296
Biphenyl	00B-4622-AN	00F-4622-AN	AJO-9209	00B-4622-Y0	AJO-9208	00B-4622-E0	00D-4622-E0	00F-4622-E0	00G-4622-E0	00F-4622-E0	00G-4622-E0	AJO-9207
XB-C18	00B-4496-AN	00F-4496-AN	AJO-8782	00B-4496-Y0	AJO-8775	00B-4496-E0	00D-4496-E0	00F-4496-E0	00G-4496-E0	00F-4496-E0	00G-4496-E0	AJO-8768

for 2.1 mm ID

for 3.0 mm ID

for 4.6 mm ID

Kinetex 1.7 µm Columns (mm) SecurityGuard ULTRA Cartridges (mm)

Phases	50 x 2.1		100 x 2.1		150 x 2.1		3/pk	
	EVO C18	00B-4726-AN	00D-4726-AN	00F-4726-AN	—		AJO-9298	
Biphenyl	00B-4628-AN	00D-4628-AN	00F-4628-AN	—		AJO-9209		
XB-C18	00B-4498-AN	00D-4498-AN	—	—		AJO-8782		

for 2.1 mm ID

*SecurityGuard ULTRA cartridges require holder, Part No.: AJO-9000.

For additional Kinetex dimensions and phases, please visit
www.phenomenex.com/kinetex

roQ QuEChERS Resources and Tools

Access All of Your roQ Resources

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- Applications
- Technical Notes
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- Tools
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roQ QuEChERS Selection Poster

www.phenomenex.com/roQ

A selection poster for roQ QuEChERS Kits. The poster is titled 'Choose Your QuEChERS Solution in Under 1 Minute' and features the roQ QuEChERS Kits logo. It is divided into several sections: 'Step 1: Extraction' with sub-sections for AOAC, ORIGINAL, and EN; 'Step 2: Clean Up/USFE'; and 'Step 3: Analysis by GC or HPLC'. There are also sections for 'Solids and Solvents Used in roQ Kits' and 'Clean Up Kits'. The poster includes a table of kits and their specifications, and a small image of a bowl of fresh vegetables. The Phenomenex logo is at the bottom right, and the website URL 'www.phenomenex.com/roQ' is at the bottom left.



We're here to help!

Contact a Sample Preparation Specialist

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www.phenomenex.com/livechat

or by email:

Support@Phenomenex.com

For Additional Food Resources Visit

www.phenomenex.com/food

Accessories for Your Extraction



Benefits of Using

Phenex Syringe Filters:

- Rapid filtration of LC and GC samples prior to analysis
- Less system downtime
- More consistent, reproducible results
- Increased column lifetime
- Wide variety of membranes ideal for any application



Benefits of Using

Verex LC/GC Vial Products:

- Three levels of certification
 - Level 1 – Certified
 - Level 2 – Certified PLUS
 - Level 3 – Certified MSQ (Mass Spec Quality)
- 100% defect free
- Cleanroom packaged
- Increased column lifetime
- Made with inert, high-purity borosilicate glass

Get it all at
www.phenomenex.com/accessories



A Quicker and Easier Sample Preparation Choice

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Disclaimer

Comparative separations may not be representative of all applications.

SecurityGuard is patented by Phenomenex. U.S. Patent No. 6,162,362

CAUTION: this patent only applies to the analytical-sized guard cartridge holder, and does not apply to SemiPrep, PREP, or ULTRA holders, or to any cartridges.

Kinetex EVO is patented by Phenomenex. U.S. Patent Nos. 7,563,367 and 8,658,038 and foreign counterparts.

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