



roQ™

QuEChERS Kits

An Easier
QuEChERS Solution
for Diverse Matrices

 **phenomenex**[®]
*...breaking with tradition*SM

Learn more at
www.phenomenex.com/roQ



What is roQ™ QuEChERS?

QuEChERS is a descriptive acronym that stands for Quick, Easy, Cheap, Effective, Rugged, and Safe. Improved with you in mind, the unique design of the roQ QuEChERS kits eliminates common problems seen with current QuEChERS kits. By incorporating features such as trays to hold centrifuge tubes, easy pour salt packets, and stand alone centrifuge tubes, roQ QuEChERS Kits make the QuEChERS procedure even easier!

Stay Organized with Built-In Test Tube Racks

roQ boxes are designed with removable racks that can be used as test tube racks



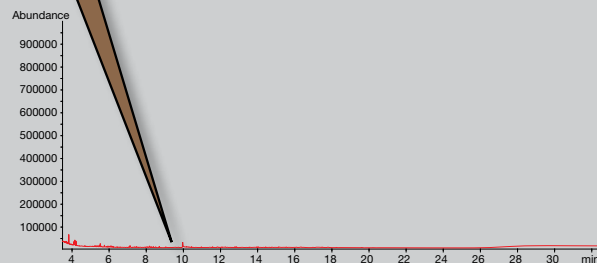
Easily Weigh Out Samples with Stand Alone Centrifuge Tubes

Simultaneously add sample while weighing, no transfer steps required



Cleaner Extracts with Low Extractable Tubes

Reduce background noise in chromatograms



15 mL roQ centrifuge tube extracted with 1 % Acetic acid in Acetonitrile and then with Toluene.

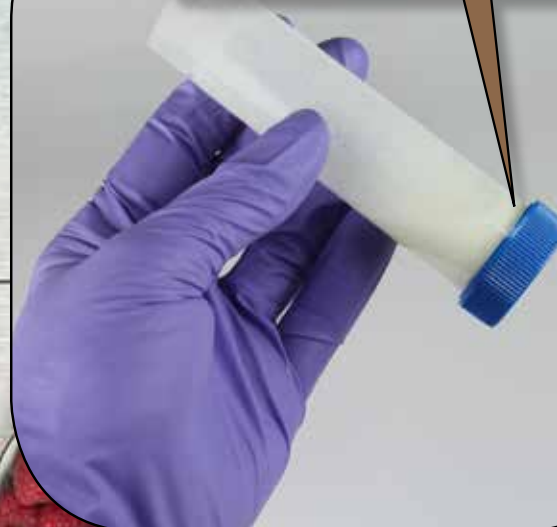
No Salt Spills with Easy Pour Salt Packets

Our easy open, easy pour salt packets have a narrow spout which makes salt addition easy



Avoid Leaky Tubes with No Leak Caps

We guarantee our tubes won't leak!



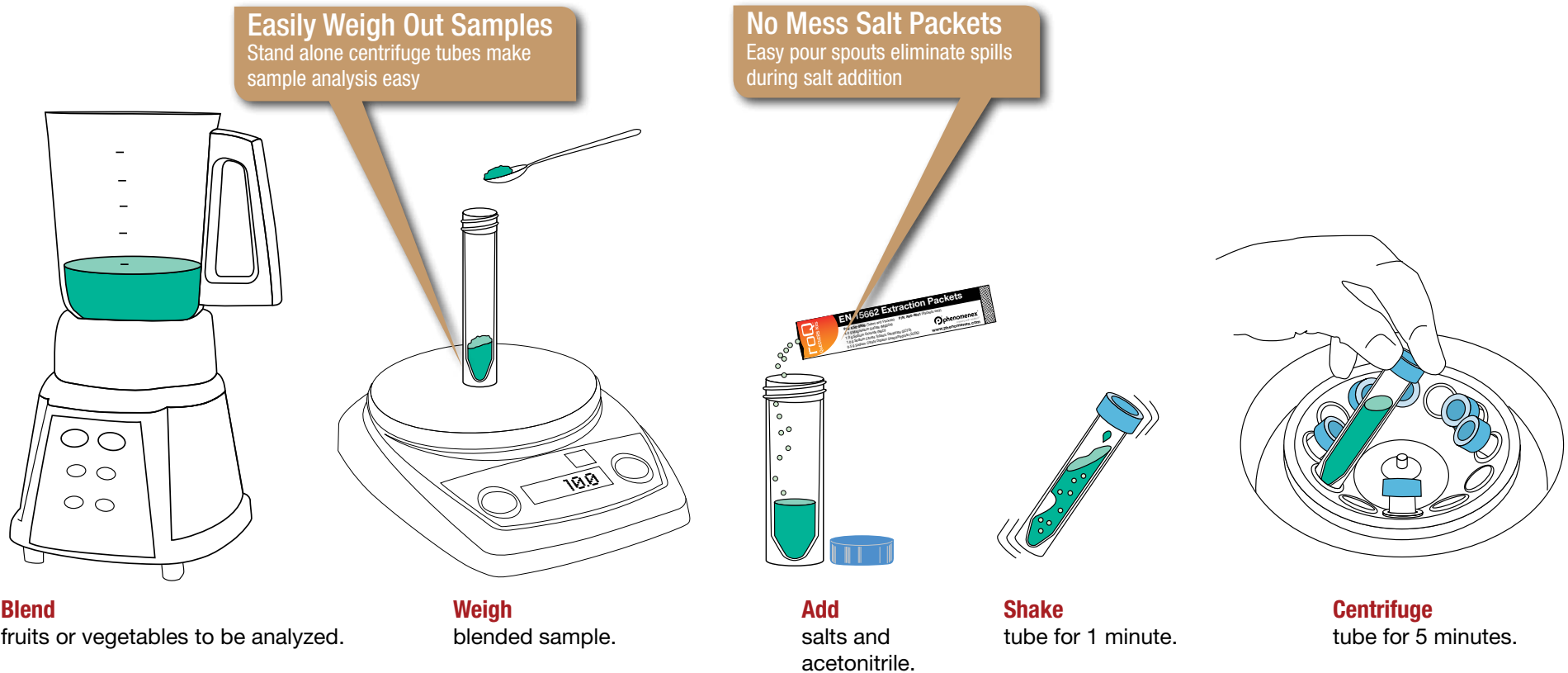
How does it work?

The QuEChERS technique addresses shortcomings of traditional sample preparation methods, such as long extraction procedures and the use of hazardous solvents, and radically simplifies multi-residue pesticide analysis in food or environmental samples.

The QuEChERS technique consists of two steps; Extraction and Dispersive SPE (dSPE)

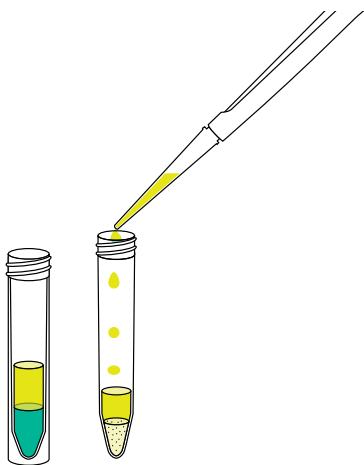
Step 1: Extraction

Pesticides and analytes of interest must first be extracted from the sample. This process relies on the combination of organic solvent and various salts to partition the analytes from samples into an organic layer (typically acetonitrile).



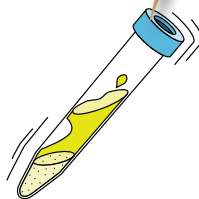
Step 2: Dispersive SPE (dSPE)

An aliquot of the organic layer from the extraction step is subjected to further clean up by dispersive SPE. This step selectively removes unwanted interferences such as lipids and pigments.

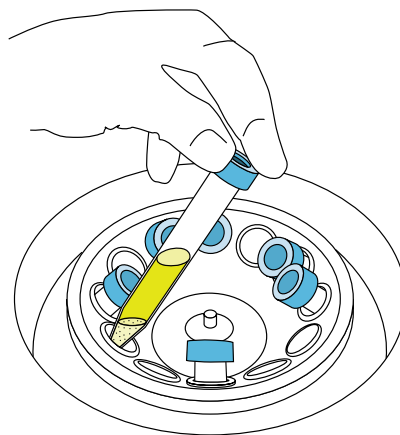


Add
supernatant from extraction procedure into a roQ dSPE tube.

Avoid Leaky Tubes
Our tubes are designed to seal completely

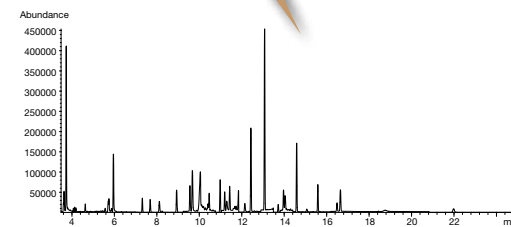


Shake
dSPE tube for 30 seconds.



Centrifuge
dSPE tube for 5 minutes.

Cleaner Extracts
roQ kits contain low extractable centrifuge tubes reducing background noise in chromatograms



Analyze
supernatant by GC or HPLC.

Step 1

roQ™ Extraction Kits

QuEChERS can be performed by following 3 different methods: the AOAC 2007.01 Method, the EN 15662 Method, or the Original Non-Buffered Method.

Use the chart below to select the most appropriate kits for your work and sample size/type.

AOAC 2007.01 Method

Salts used:

Magnesium Sulfate (MgSO₄)

Induces phase separation between water content in sample and acetonitrile layer

Sodium Acetate (NaOAc)

Buffers the sample to stabilize pH

Original Non-Buffered Method

Salts used:

Magnesium Sulfate (MgSO₄)

Induces phase separation between water content in sample and acetonitrile layer

Sodium Chloride (NaCl)

Induces phase separation between water content in sample and acetonitrile layer

EN 15662 Method

Salts used:

Magnesium Sulfate (MgSO₄)

Induces phase separation between water content in sample and acetonitrile layer

Sodium Chloride (NaCl)

Induces phase separation between water content in sample and acetonitrile layer

Sodium Citrate Tribasic Dihydrate (SCTD)

Buffers the sample to stabilize pH

Sodium Citrate Dibasic Sesquihydrate (SCDS)

Buffers the sample to stabilize pH

Sample Size

15 g

Part No.: **KS0-8911**

15 g

Part No.: **KS0-8912**

to be used with AOAC 2007.01 dSPE procedure

or

10 g

Part No.: **KS0-8910**

to be used with EN 15662 dSPE procedure

10 g

Part No.: **KS0-8909**

All roQ Extraction Kits include 50 easy-pour salt packets and fifty 50 mL stand-alone centrifuge tubes.

Step 2

Select Your roQ™ dSPE Kit

Fruit and Vegetable Type

Method	Sample Size	General		Fats and Waxes		Pigmented		Highly Pigmented		Pigments and Fats	
		Contents	Part No.	Contents	Part No.	Contents	Part No.	Contents	Part No.	Contents	Part No.
AOAC 2007.01	1 mL	150 mg MgSO ₄ 50 mg PSA	KS0-9511	150 mg MgSO ₄ 50 mg PSA 50 mg C18E	KS0-9512	150 mg MgSO ₄ 50 mg PSA 50 mg GCB	KS0-9513	—	—	150 mg MgSO ₄ 50 mg PSA 50 mg GCB 50 mg C18E	KS0-9514
	8 mL	1200 mg MgSO ₄ 400 mg PSA	KS0-9515	1200 mg MgSO ₄ 400 mg PSA 400 mg C18E	KS0-9516	1200 mg MgSO ₄ 400 mg PSA 400 mg GCB	KS0-9517	—	—	1200 mg MgSO ₄ 400 mg PSA 400 mg GCB 400 mg C18E	KS0-9518
EN 15662	1 mL	150 mg MgSO ₄ 25 mg PSA	KS0-9503	150 mg MgSO ₄ 25 mg PSA 25 mg C18E	KS0-9504	150 mg MgSO ₄ 25 mg PSA 2.5 mg GCB	KS0-9505	150 mg MgSO ₄ 25 mg PSA 7.5 mg GCB	KS0-9506	—	—
	6 mL	900 mg MgSO ₄ 150 mg PSA	KS0-9507	900 mg MgSO ₄ 150 mg PSA 150 mg C18E	KS0-9508	900 mg MgSO ₄ 150 mg PSA 15 mg GCB	KS0-9509	900 mg MgSO ₄ 150 mg PSA 45 mg GCB	KS0-9510	—	—

Salts and sorbents used in roQ dSPE kits

Magnesium Sulfate (MgSO₄)	Removes excess water from sample
Primary/Secondary Amine (PSA)	Removes organic acids, fatty acids, sugars, and anthocyanin pigments from sample
Endcapped C18 Sorbent (C18E)	Removes fats, sterols, and other non-polar interferences from sample
Graphitized Carbon Black (GCB)	Removes pigments from sample NOT FOR USE WITH PLANAR PESTICIDES

All roQ dSPE Kits include pre-weighed sorbents/salts inside 2 mL or 15 mL centrifuge tubes.

Extraction of Pesticide Residues from Kale and Grapes Using roQ™ EN 15662 QuEChERS Kit

LC-MS Analysis

Over 200 pesticides were screened at concentration ranges between 0.01 ppm to 1 ppm with the majority of analytes having a recovery range of 70-130%. The method produced excellent selectivity and reproducibility for the earlier eluting polar pesticides owing to the use of QuEChERS for removing sample matrix interferences and the biphenyl bonded-phase chemistry of the Kinetex® Biphenyl LC column for the chromatographic separation across the entire range of pesticides.

QuEChERS Procedure (EN 15662 Method)

Kale and grapes samples were prepared at four concentrations: no spike (0.0 ppm), low spike (0.1 ppm), medium spike (0.5 ppm), and high spike (1 ppm)

Pretreatment: Kale and grapes were frozen at ~-80°C overnight

Step 1: Extraction

1. Homogenize sample using a blender or similar apparatus.
2. Weigh 10 g of homogenized sample into a clean 50 mL tube (provided in roQ Extraction Kits).
3. Add 10 mL of Acetonitrile containing internal standard.
4. Dispense contents of the included QuEChERS salt packet into the 50 mL tube containing homogenized sample.
5. Shake vigorously by hand for 1 minute.
6. Centrifuge for 5 minutes @ 4000 rpm, making sure that the solid material is at the bottom of the tube and a liquid layer forms on top of the solid material.

Step 2: Dispersive SPE (dSPE)

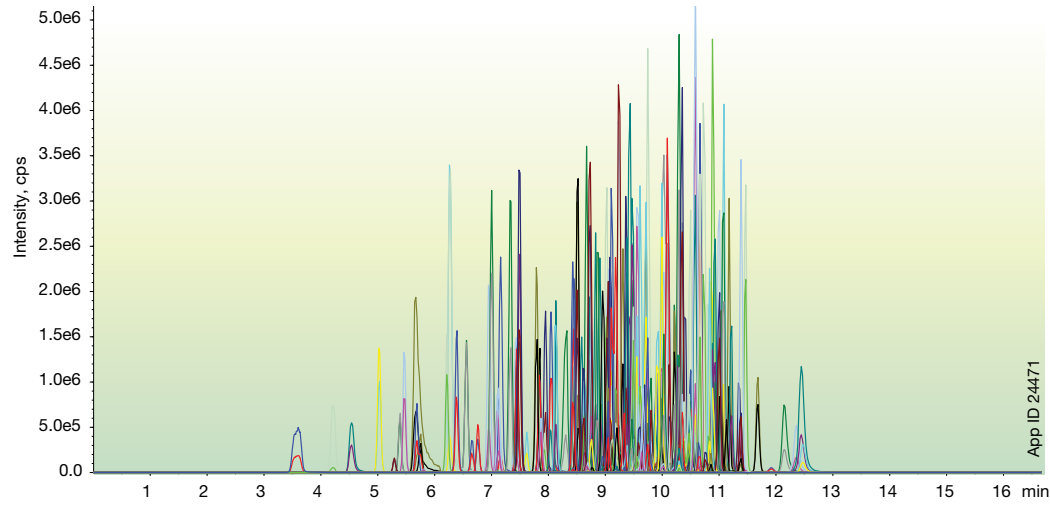
1. Transfer 6 mL of supernatant from Step 6 of the extraction process into the 15 mL tube containing the QuEChERS dSPE sorbents.
2. Shake vigorously by hand for 30 seconds.
3. Centrifuge for 5 minutes @ 4000 rpm to separate solid material from the liquid layer.
4. Transfer desired supernatant to an autosampler vial.
5. Dilute samples 1:10 in mobile phase A prior to injection or LC-MS analysis.

To read full technical note, go to
www.phenomenex.com and

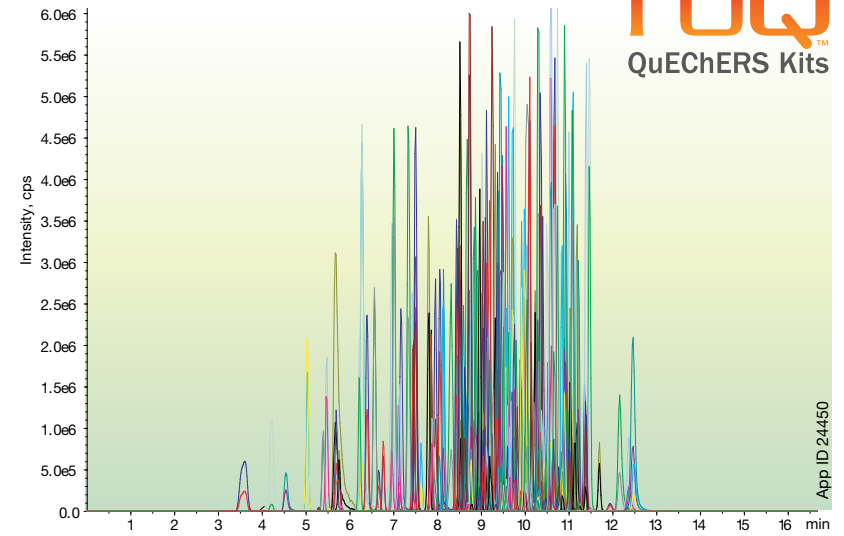
Search:



Standard Chromatogram (0.5 ppm standard)



Kale Sample (1 ppm spike)



LC-MS/MS Conditions

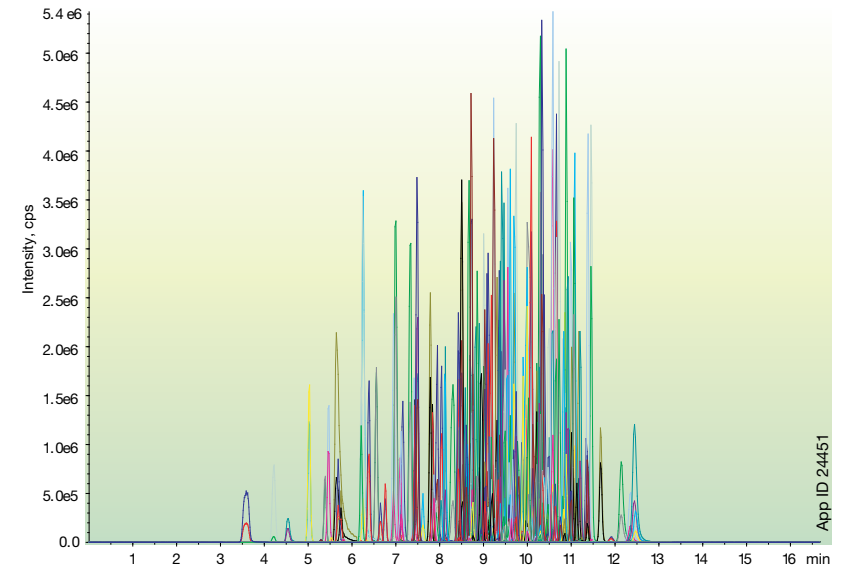
Column: Kinetex® 5 µm Biphenyl	Flow Rate: 0.5 mL/min
Dimensions: 50 x 4.6 mm	Inj. Volume: 20 µL
Part No.: 00B-4627-E0	Temperature: 35 °C
SecurityGuard™ ULTRA: AJ0-9207	Detection: MS/MS (ESI+), scheduled MRM
Mobile Phase: A: 10mM Ammonium Formate in Water	Instrument: SCIEX 4000 QTRAP®
B: Methanol	
Gradient:	
Time (min) % B	
0 2	
1 2	
10 100	
13 100	
13.1 2	
16 2	

Sample: For full list of 210 pesticides, go to www.phenomenex.com and

Search:



Grapes Sample (0.5 ppm spike)



Mycotoxins from Corn Meal Products Using roQ™ EN 15662 QuEChERS Kit LC-MS/MS

The use of roQ QuEChERS and Kinetex® XB-C18 Core-Shell Technology LC columns deliver a rapid and simple approach for mycotoxin screening from corn products.

QuEChERS Procedure (EN 15662 Method)

Step 1: Extraction from Ground Corn

1. Homogenize sample using a blender or similar apparatus
2. Weigh and transfer 5g of ground corn meal to a 50 mL roQ QuEChERS extraction tube
3. Add 10 mL of water and 10 mL of acetonitrile with 1.0 % formic acid
4. Dispense contents of the included roQ QuEChERS extraction packet (KS0-8909) into the 50 mL tube containing homogenized sample
5. Shake vigorously by hand for 1 minute
6. Centrifuge for 5 minutes @ 4000 rpm, making sure that the solid material is at the bottom of the tube and a liquid layer forms on top of the solid material

Step 2: Clean up using dispersive Solid Phase Extraction (dSPE)

1. Transfer the supernatant from Step 6 of the extraction process into a roQ QuEChERS 15 mL centrifuge tube containing 900 mg MgSO₄ and 150 mg PSA (KS0-9507)
2. Shake vigorously by hand for 30 seconds
3. Centrifuge for 5 minutes at 4000 rpm to separate solid material from the liquid layer
4. Transfer the supernatant to a vessel for evaporation

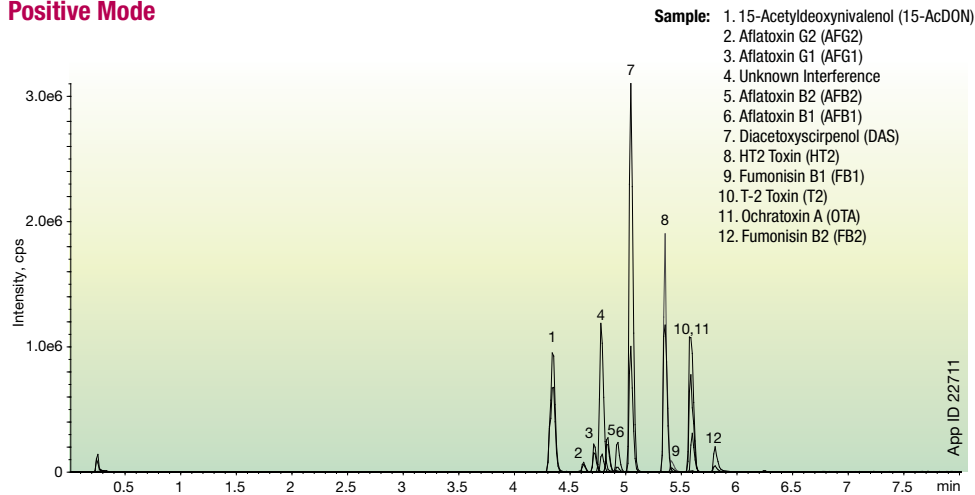
LC-MS/MS Conditions

Column: Kinetex® 2.6 µm XB-C18
Dimensions: 50 x 2.1 mm
Part No.: 00B-4496-AN
SecurityGuard Cartridge: AJO-8782
Mobile Phase: A: 5 mM Ammonium acetate with 0.5% Acetic acid
 B: 5 mM Ammonium acetate in Methanol with 0.5% Acetic acid

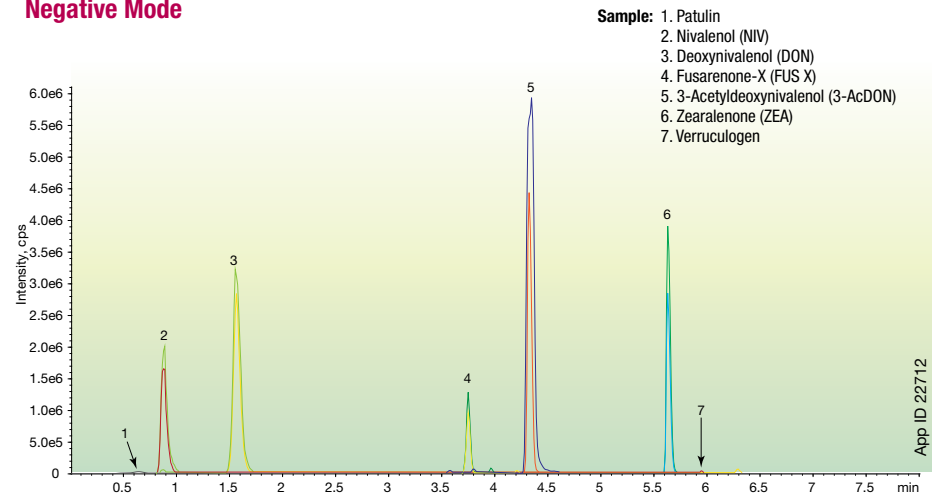
Gradient: Time (min)	% B
0	5
2	5
5	80
5.2	98
8	98

Flow Rate: 0.45 mL/min
Temperature: Ambient
Injection Volume: 25 µL
Detection: Tandem Mass Spec (MS/MS)
Instrument: SCIEX API 5000™

Positive Mode



Negative Mode



Free Method Development Support and Guidance



Did you know?

You have a Phenomenex technical support team dedicated to supporting your lab's needs! We collaborate with chemists every day to improve productivity and results while working within the bounds of your established methods.

Email: info@phenomenex.com



Determination of PFASs in Sediments Using roQ™ AOAC 2007.01 QuEChERS Kits

LC-MS Analysis

In order to extract Perfluoroalkyl substances (PFASs) from marine and freshwater sediment, QuEChERS was introduced to save time and offer reliable results.

QuEChERS Procedure (AOAC 2007.01 Method)

Step 1: Extraction from Sediments

1. Weigh 2.0 g of suitably dried sediment into a polypropylene container and spike with isotopically-labeled internal standards. PPCPs, Steroids, and Pyrethroids can be extracted concurrently with this method by adding the appropriate internal standard and spiking solutions to the samples and QCs.
2. Add 10 mL deionized water and vortex. Add 10 mL acidified acetonitrile (1 % Acetic acid) to the slurry and vortex.
3. Add the extraction salts (1.5 g Sodium acetate and 2 g MgSO₄) to the sample and vortex for 1 minute.
4. Centrifuge the samples for 5 minutes at 4000 rpm.
5. Place the samples in a rack and freeze at -20 °C for 30-60 minutes. This freezing step allows for easier extraction of the supernatant.

Step 2: Clean up Using dispersive Solid Phase Extraction (dSPE)

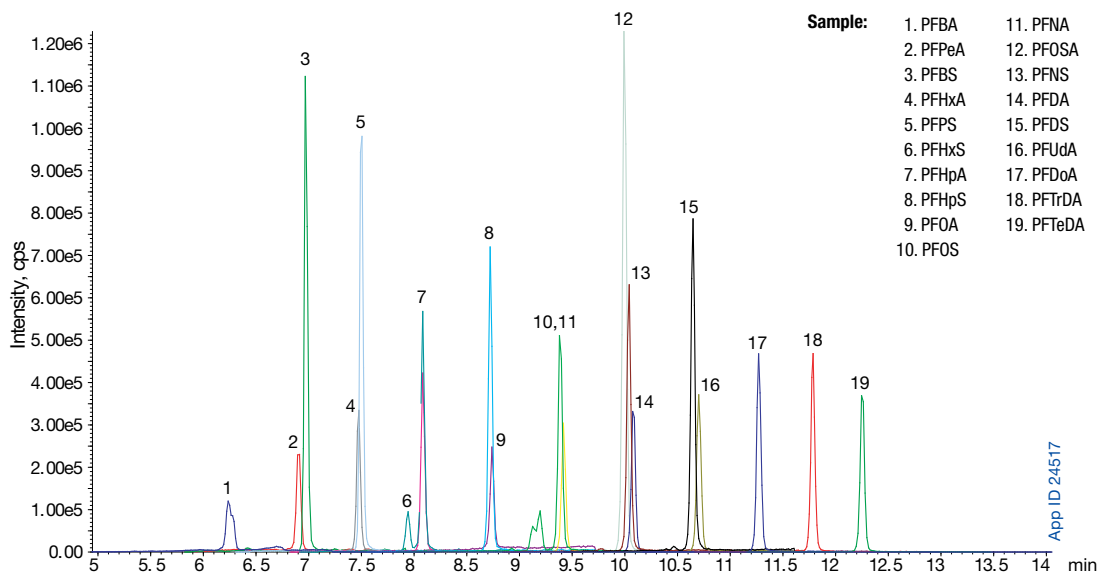
1. Transfer 8-9 mL of the acetonitrile supernatant into a roQ QuEChERS PSA/C18 dSPE clean-up tube (Part no. KS0-9516)
2. Vortex for one minute.
3. Centrifuge the dSPE tubes for 10 minutes at 3000 rpm.
4. Place an aliquot of the extract in a polypropylene HPLC vial and dilute 1:1 with deionized water. The sample is now ready for analysis.

LC-MS/MS Conditions

Column:	Gemini® 3 µm C18	
Dimensions:	100 x 3.0 mm	
Part No.:	00D-4439-Y0	
Inline Filter:	Phenomenex KrudKatcher™ Ultra (AFO-8497)	
Delay Column:	Luna® 5 µm C18(2) 30 x 2.0 mm	
Part No.:	00A-4252-B0	
Mobile Phase:	A: 20 mM Ammonium acetate in Water B: Methanol	
Gradient:	Time (min)	% B
	0	10
	1.5	65
	8	95
	8.1	99
	12	99
Flow Rate:	0.6 mL/min	
Injection:	90 µL	
Temperature:	40 °C	
Detector:	SCIEX 5500 QTRAP®	
Detection:	MS/MS ESI Negative (sMRM)	
Samples:	1. PFBA	11. PFNA
	2. PFPeA	12. PFOSA
	3. PFBS	13. PFNS
	4. PFHxA	14. PFDA
	5. PFPS	15. PFDS
	6. PFHxS	16. PFUDa
	7. PFHpA	17. PFDoA
	8. PFHpS	18. PFTeDA
	9. PFOA	19. PFTeDA
	10. PFOS	



Sediment Spiked with 1 ng/g



Method Performance Data for Sediments Spiked at 1 ng/g of the Target Analytes (n=4)

Compound	Average % Recovery	% RSD
PFBA	91.7	0.76
PFPeA	86.3	6
PFHxA	89.4	1.2
PFHpA	93.1	2.9
PFOA	98.3	1.5
PFNA	93	1.6
PFDA	87.7	4.5
PFUdA	92.3	2.1
PFDoA	92.5	4.1
PFTrDA	88.2	2.1
PFTeDA	87.6	2.1
PFBS	86.3	2.1
PFPeS	96.2	3.2
PFHxS	81.3	5
PFHpS	92.3	2.6
PFOS	92.1	2.6
PFOSA	104.5	6.3
PFNS	89.8	6.8
PFDS	87.3	6.7

Learn more about roQ QuEChERS

Visit: www.phenomenex.com/roQ



Acknowledgement

Special thanks to Syljohn Estil and the Sanitation Districts of Los Angeles County - San Jose Water Quality Laboratory for contributing this method.

Analysis Tools You Can Depend On

Achieve resolution of multi-residues with Phenomenex HPLC, UHPLC, and GC columns.

UHPLC/HPLC

Luna Omega High Performance Silica-based HPLC Columns



Enhanced with 20 years of technology, innovation, and experience, Luna Omega columns build upon the Luna legacy to now provide incredible UHPLC/HPLC performance and selectivity. With Luna Omega columns you gain:

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- Extensive method validation document for proven reproducibility



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UHPLC/ HPLC

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- Increase resolution, throughput, and sensitivity
- Decrease solvent consumption
- Save time and money
- Transfer methods anywhere



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GC

Zebron High Performance ZB-MultiResidue™ Columns



ZB-MultiResidue-1 & -2 columns are optimized for pesticides, herbicides, and insecticide analysis. These columns have an orthogonal selectivity that allows them to be used together in dual column confirmation analysis.

- Low activity, decreased breakdown of sensitive pesticides such as DDT
- MS Certified phases provide low bleed performance for pesticide confirmation by MS
- Long column lifetimes



Visit www.phenomenex.com/zebron for more information.



Ordering Info

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

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

Bulk roQ QuEChERS Sorbents

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

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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	KSO-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	KSO-9041
Original Non-Buffered Method Extraction Packets		
4.0 g MgSO ₄ , 1.0 g NaCl	50/pk	KSO-9042
6.0 g MgSO ₄ , 1.5 g NaCl	50/pk	KSO-9044

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Contact your Sample Preparation Specialist
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