



Selecting the appropriate QuEChERS extraction method for pesticides in foods

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Introduction

Thermo Scientific™ HyperSep™ QuEChERS dispersive SPE products provide a Quick, Easy, Cheap, Effective, Rugged and Safe sample preparation technique for multi-residue pesticide analysis. QuEChERS methods overcome problems associated with time consuming, expensive and labor intensive multi-residue methods (MRM). QuEChERS is a fast and easy sample preparation method with a robust process and high recovery and reproducibility.

Products are available in a wide range of formats to meet application requirements, and the best format for each application depends on the properties of the sample matrix and the pesticides of interest.

Important notes

Multi-residue methods may contain analytes from multiple categories. Evaluation of multiple extraction and clean-up protocols may be required during method development in order to find the optimum method for individual applications.

Selecting extraction method based on analytes

Analytes	Examples	Recommended Method
Acid Sensitive	Acephate, Acrinathrin, Carbaryl, Chlorothalonil, Diclorvos, Dimethoate, Mevinphos, Phosmet, Pymetrozine	QuEChERS <ul style="list-style-type: none"> Simplest extraction Cleanest baselines Low recovery for some base-sensitive analytes
Base Sensitive	Folpet, Dicofol, Captan, Dichlofluanid, Tolyfluanid, Chlorothalonil	AOAC <ul style="list-style-type: none"> Extraction solvent with sodium acetate Less effective matrix removal
Acid or Base Sensitive		European <ul style="list-style-type: none"> Balanced for either Acid or Base Sensitive Analytes
Planar	Carbendazim, Mepanipyrm, Chlorothalonil, Pentachloroaniline, Cyprodinil, Phenmedipham, Demedipham, Phosalone, Diflubenzuron, Pymetozinem, Flucycloxuron, Pyrimethanil, Hexachlorobenzene, Quinoxyfen, Hexaflumuron, Thiabendazole	Schenck <ul style="list-style-type: none"> Dual layer GCB/PSA SPE cartridge Improved recovery of certain planer analytes Pigmented matrices

Selecting clean-up sorbent based on matrix

Matrix Type	Examples	Sorbent Recommendations for Clean-Up
General	Apples, Cucumber, Melon	MgSO ₄ , PSA Removal of excess water, organic acids, fatty acids, and sugars
Fatty	Milk, Cereals, Fish	MgSO ₄ , PSA, C18 Additional removal of lipids and sterols
Pigmented	Lettuce, Carrot, Wine	MgSO ₄ , PSA, C18, GCB Additional removal of pigments and sterols
Highly Pigmented	Spinach, Red Peppers	MgSO ₄ , PSA, C18, GCB, Chlorofiltr™ Additional removal of chlorophyll

Selecting the correct product scale

Generally, 10 g or 15 g of sample will generate the best results. Smaller samples produce higher variability.

	Sample/Extract Size	Sorbent Amount
Extraction Salts	10 g sample	4 g MgSO ₄
	15 g sample	6 g of MgSO ₄
dSPE cleanup tubes	10 mL extract	1.2 g of MgSO ₄ in 15 mL tube
	8 mL extract	0.9 g of MgSO ₄ in 15 mL tube
	1 mL extract	0.15 g of MgSO ₄ in 2 mL tube

Current versions of product instructions are available at separatedbyexperience.com/chromexpert

See all HyperSep dispersive SPE extraction and clean-up products at thermofisher.com/QuEChERS

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