

# Improving mobile phases for LC-MS testing of residues in foods

The LC-MS based food residue analysis involves the determination of trace levels of pesticides in vegetables, fruits and beverages, as well as the veterinary drug residues in food products of animal origins. As illustrated in Figure 1, the analytical workflow based on LC-QQQ allows for detecting multi-residues of multi-classes at low to sub ppb levels.

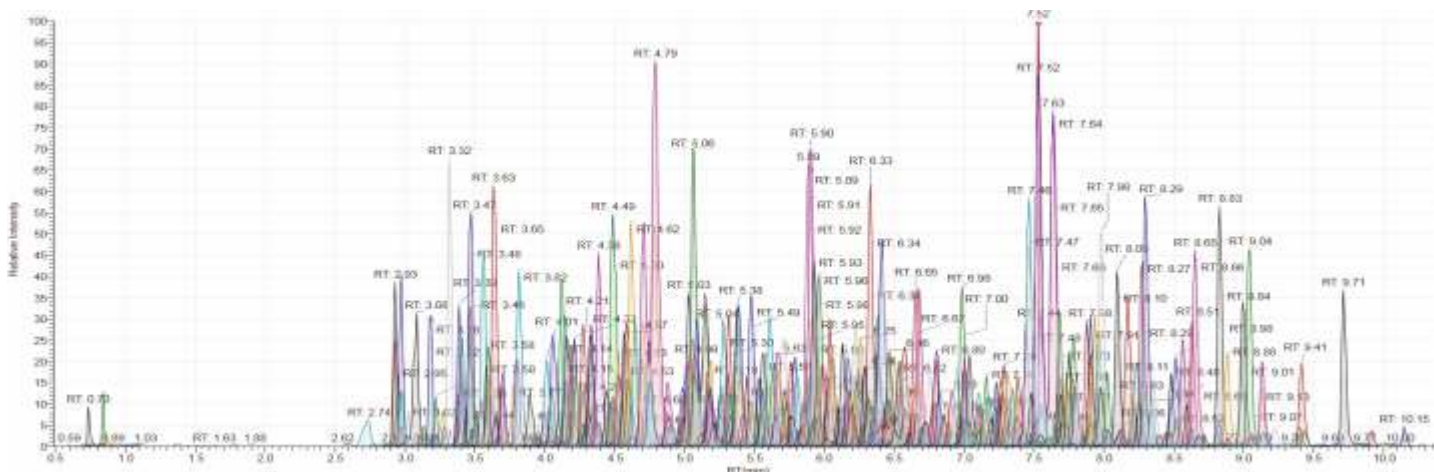


Figure 1. LC-QQQ MRM chromatogram of 500+ pesticide method in 12 min from Thermo Scientific's Pesticide Explorer 2.0 solution.

With several hundreds of residues eluting in a single chromatographic run, the impurities in LC-MS mobile phases can adversely impact the integrity of the results, either by direct interference from pesticide impurities present in solvents or by ion suppression via the co-eluted impurities. Thus it is critical that high purity LC-MS grade solvents be used in the LC-QQQ based residue analysis.

Thermo Fisher Scientific offers two grades of LC-MS reagents. The Fisher Chemical™ Optima™ grade LC-MS solvents are made in high purity and meet all the needs for LC-MS analysis. The same Optima™ grade LC-MS blends are precisely made with lot-to-lot consistency and as a convenient choice for QC labs. The Thermo Scientific™ UHPLC-MS grade solvents are a higher grade tested according to more stringent specifications to meet the most sensitivity-demanding analysis.

Both LC-MS and UHPLC-MS grades of solvents and blends are fully tested to ensure low trace metal and organic impurities to minimize the interferences, as demonstrated by impurity profile test of our UHPLC-MS methanol against 2 ppb reserpine (Figure 2A) and our LC-MS gradient suitability tests against two competitors' top-grade LC-MS methanol (Figure 2B).

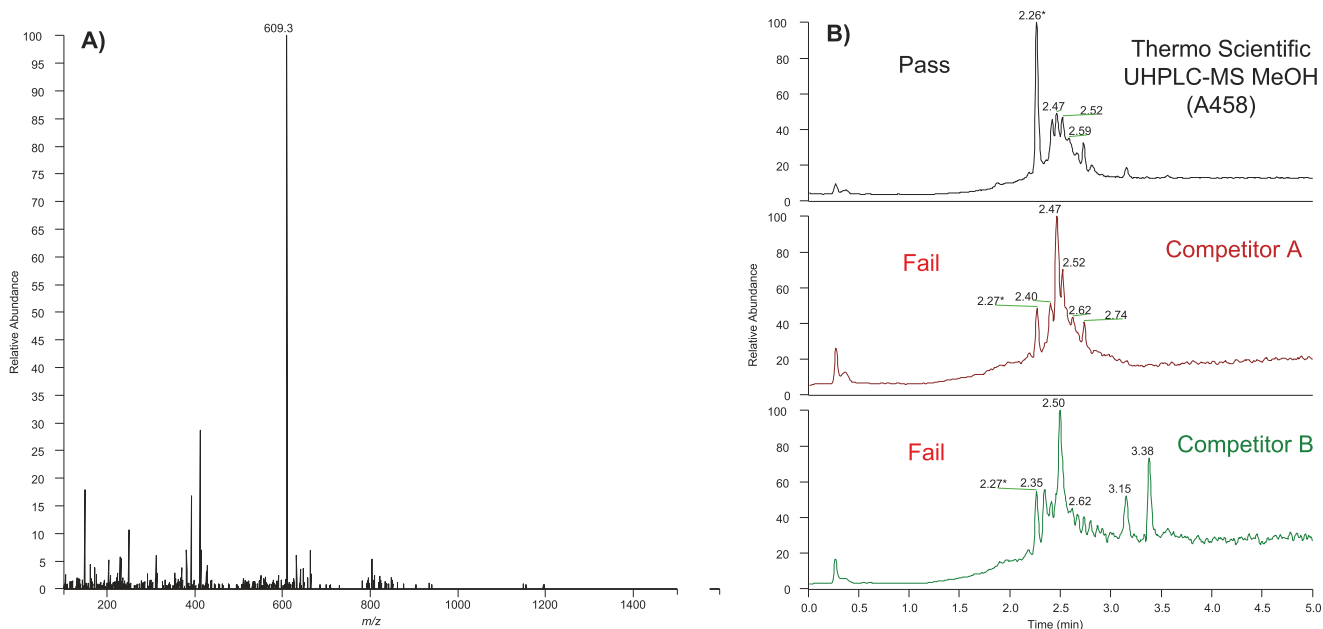


Figure 2. A) Direct infusion of UHPLC-MS MeOH spiked with 2 ppb reserpine as standard: no impurity peaks above 2 ppb reserpine; B): Comparison of LC-MS gradient suitability tests of UHPLC-MS grade MeOH from three vendors: criteria for pass defined as no impurity peaks higher than 125 pg propazine internal standard at RT=2.27 min (\*).

### Purity Grades for Every LC/MS Application

Fisher Chemical Optima™ LC-MS Grade Solvents: general purpose for all LC-MS applications, low organic and metal impurities, tested with stringent LC-MS gradient suitability tests

Description	Packaging	Quantity	Cat. No.
Acetonitrile	Amber Glass Bottles	500mL, 1L, 2.5L, 4L	A955
Methanol	Amber Glass Bottles	500mL, 1L, 2.5L, 4L	A456
Water	Amber Glass Bottles	500mL, 1L, 2.5L, 4L	W6
2- Propanol	Amber Glass Bottles	500mL, 1L, 2.5L, 4L	A461

Thermo Scientific™ UHPLC-MS Grade Solvents: ultrapure quality solvents to meet your most demanding UHPLC and LC-MS applications for low background and high sensitivity.

Description	Packaging	Quantity	Cat. No.
Acetonitrile	Clear Borosilicate Glass Bottles	1L	A956-1
Methanol	Clear Borosilicate Glass Bottles	1L	A458-1
Water	Clear Borosilicate Glass Bottles	1L	W8-1

Thermo Scientific™ UHPLC-MS Reagent Installation Kit (Cat. No. UHPLCMSKIT): recommended for setting up and passing the specification tests during the installation of a new LC-MS system, the kit includes:

- 1L Acetonitrile (Cat. No. A956-1)
- 2 × 1L Methanol (Cat. No. A458-1)
- 2 × 1L Water (Cat. No. W8-1)
- 1L Thermo Scientific ChromaCare Instrument Flush Solution (Cat. No. T111101000): a blend of 25% acetonitrile, 25% methanol, 25% water, and 25% 2-propanol (IPA) to clean the flow path of LC-MS system.



Fisher Chemical Optima™ LC-MS Grade Mobile Phase Blends: precisely pre-blended for convenience and tested for lot-to-lot consistency

Description	Packaging	Quantity	Cat. No.
Acetonitrile with 0.1% FA	Amber Glass Bottles	500mL, 1L, 2.5L, 4L	LS120
Acetonitrile with 20% Water and 0.1% FA	Amber Glass Bottles	500mL	LS122-500
Water with 0.1% FA	Amber Glass Bottles	500mL, 1L, 2.5L, 4L	LS118

Fisher Chemical Optima™ LC-MS Grade Mobile Phase Additives: tested for high impurity and low trace metals for LC-MS use.

Description	Packaging	Quantity	Cat. No.
Formic Acid	Poly bottle	50mL	A117-50
	Ampules	0.5, 1, 2, 10 × 1mL	A117
Acetic Acid	Poly bottle	50mL	A113-50
	Ampules	1, 10 × 1mL	A113
Ammonium Formate	Glass bottle	50g	A11550
Ammonium Acetate	Glass bottle	50g	A11450

Find out more at [www.thermofisher.in/chemicals](http://www.thermofisher.in/chemicals)

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