

FOOD ANALYSIS

DETERMINATION OF MULTI-PESTICIDE RESIDUES IN RED CHILI POWDER USING QUECHERS AND THE AGILENT 7000 SERIES TRIPLE QUADRUPOLE GC/MS SYSTEM

The Measure of Confidence

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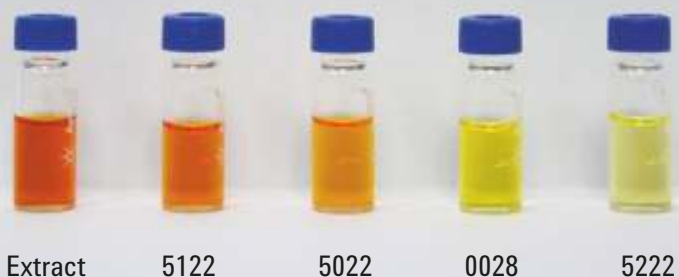
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A validated method has been developed for the analysis of 90 pesticides in dried red chili powder using the QuEChERS sample preparation technique and the Agilent 7000 GC-Triple Quadrupole Mass Spectrometer, with a run time of 20.75 minutes.

Analysis of pesticide residues in red chili powder is a real analytical challenge due to its complex matrix and required maximum residue levels (MRL). Sample preparation was optimized in order to eliminate pigment and other co-extractives which could cause retention time shifting, affect chromatographic peak shape and cause loss of sensitivity of the target analytes.



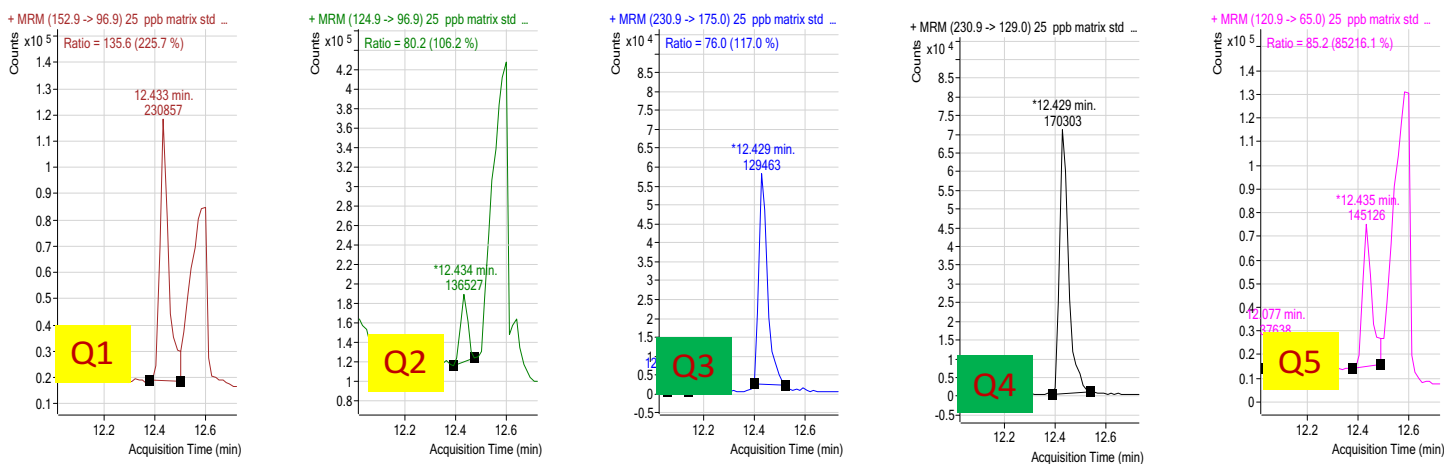
Extract and four different dispersive clean up: 5222 kits removing more pigments and consequently enhance column, liner life & source cleaning. The recovery for the majority of the compounds is between 70-120%



Agilent Technologies

RT - CF screening (80.3 min)	RI - CF screenin	RT - opt 413 (11.887 m)	RI - opt 412 (20.79 min)	User Field (Method Name)	CAS #	Common Name	Method RT	ISTD	Precursor Ion	MS1 Resolutio	Product Ion	MS2 Resolutio	Dwell Time (ms)	CE (V)		
2770	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	124.9	LowRes	47.0	LowRes	10	15
2771	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	124.9	LowRes	78.9	LowRes	10	5
2772	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	285.9	LowRes	92.9	LowRes	10	20
2773	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	287.9	LowRes	92.9	LowRes	10	20
2774	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	285.9	LowRes	270.7	LowRes	10	15
2775	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	287.9	LowRes	272.7	LowRes	10	15
2776	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	285.9	LowRes	207.7	LowRes	10	15
2777	18.11	1900	16.59	1894	9.14	1919	5598-13-0	Chlorpyrifos-methyl	9.14	false	108.9	LowRes	78.9	LowRes	10	5
5439	23.39	2187	23.86	2172	11.72	2224	60-57-1	Dieldrin	11.72	false	277.0	LowRes	241.0	LowRes	10	5
5440	23.39	2187	23.86	2172	11.72	2224	60-57-1	Dieldrin	11.72	false	262.9	LowRes	193.0	LowRes	10	35
5441	23.39	2187	23.86	2172	11.72	2224	60-57-1	Dieldrin	11.72	false	262.9	LowRes	191.0	LowRes	10	35
5442	23.39	2187	23.86	2172	11.72	2224	60-57-1	Dieldrin	11.72	false	345.0	LowRes	262.7	LowRes	10	5
5443	23.39	2187	23.86	2172	11.72	2224	60-57-1	Dieldrin	11.72	false	237.0	LowRes	142.9	LowRes	10	25
5444	23.39	2187	23.86	2172	11.72	2224	60-57-1	Dieldrin	11.72	false	237.0	LowRes	118.9	LowRes	10	25
6070	25.19	2293	26.03	2286	12.42	2309	563-12-2	Ethion	12.42	false	152.9	LowRes	96.9	LowRes	10	10
6071	25.19	2293	26.03	2286	12.42	2309	563-12-2	Ethion	12.42	false	124.9	LowRes	96.9	LowRes	10	0
6072	25.19	2293	26.03	2286	12.42	2309	563-12-2	Ethion	12.42	false	230.9	LowRes	175.0	LowRes	10	10
6073	25.19	2293	26.03	2286	12.42	2309	563-12-2	Ethion	12.42	false	230.9	LowRes	129.0	LowRes	10	20
6074	25.19	2293	26.03	2286	12.42	2309	563-12-2	Ethion	12.42	false	120.9	LowRes	65.0	LowRes	10	10

Mass spectrometric parameters were set up using the Agilent Pesticide and Environmental Contaminants Database (G9250AA). Target analyte MS/MS (or MRM) transitions were selected in order to give the best selectivity against the matrix as below.



All the available transitions from the database were analyzed for each compound, Q3 and Q4 were selected based on consistent response in longer batch analysis and for ease of integration.

To prolong the system stability and uptime, the Capillary Flow Technology was used to back flush the column to achieve a faster cycle time & decrease GC maintenance. The validation was carried out using 11 level matrix matched standards, 3 level recoveries.

Customers can adapt this instrumental method to their Agilent equipment quickly by running the built-in retention

time locking (RTL) tool in MassHunter software to regenerate the same retention time as the master method. Pigments were effectively removed from the sample by utilizing the QuEChERS sample preparation method, decreasing the need for frequent liner changes, column trimming and source cleaning.

Customer's Experience



“Agilent Pesticide Database and built-in Retention Time Locking system had helped us to set-up method for our targeted compounds faster. Especially which provides an option of Choosing matrix free MRM transition. The real challenge of reducing pigments with required recovery been achieved by the use of suitable clean-up material. As a result, a reliable performance is achieved in the quantification of 90 analytes in Red Chili Powder by 7890A-7000 GC/MS/MS.”

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(Peenya, Bangalore)



“Using the factory configured Agilent GC/MS pesticide analyzer; we could quickly set up the instrumental method for our targeted compounds. The back flush option and optimized sample preparation technique improved the performance of the equipment to a large extent. Now, we are confident to handle trace level quantification in complex matrix.”

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