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Sulfonylurea Herbicides in Groundwater*

Solid-Phase Extraction Procedure

Chromatogram of Groundwater Extract

Porapak® RDX Sep-Pak® Extraction Cartridge





Column: Symmetry C₁₈, 3.9 mm x 150 mm Sample: 500 mL of groundwater, adjust to pH 3.3 Peaks Mobile phase: A: phosphate buffer, 15 mM, pH 3.3 1. Thifensulfuron methyl B: acetonitrile 2. Metsulfuron methyl 30% B for 5 min, then linear Gradient: 3. Chlorsulfuron to 80% B in 25 min 4. Tribenuron methyl Flow rate: 1.0 mL/min Detection: UV at 225 nm (0.01 AUFS) Injection: 100 µL of final extract diluted 1:3 with water Thifensulfuron methyl Metsulfuron methy 10 5 15 0 Chlorsulfuron Tribenuron methyl Minutes

Systems:

A Waters 712 WISP[™] Sample Processor and a Waters 616 LC System. Detection was by UV using a Waters 996 Photodiode Array Detector. Data acquisition was performed using a Waters Millennium[®] 2010 Chromatography Manager.

* For more information regarding this application, see Young, M.S., J. AOAC. Int., in press.

Recovery From Spiked Groundwater

Compound	Concentration µg/L	%Recovery	% RSD(n=5)
Thifensulfuron methyl	0.10	108.0	8.9
	0.30	97.8	9.6
Metsulfuron methyl	0.10	90.8	3.3
	0.30	81.1	8.1
Chlorsulfuron	0.10	96.4	2.2
	0.30	77.6	15.0
Tribenuron methyl	0.10	117.0	5.3
	0.30	89.6	5.6

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Waters 712 WISP Sample Processor

The 712 WISP[™] combines precision and reliability to offer you an autosampler with exceptional value and versatility. The 712 WISP[™] processor offers standalone programmability in addition to PowerLine[™] system application. Each WISP[™] sample processor is designed to provide the same outstanding precision, linearity, accuracy and ease of use needed for today's most demanding HPLC users. Enhanced automation routines are easy to set up for single samples or an entire run.

Waters 616 LC System

Waters has incorporated the latest technological advances into the new Waters 616 LC system. The 616 is the culmination of leading innovative technology—fluidic, electronic, and software—designed to deliver superior performance in a premier pumping system. The 616 offers pulse-free flow, low delay volume, efficient gradient mixing, precision, accuracy, and reliability.

Waters 996 Photodiode Array Detector

Complete Spectral Data-Complete Confidence in Peak Purity and Identity.

With Waters 996 Photodiode Array Detector, you can be confident that if there is an impurity in your sample, you will find it; that your compound is really what you report it to be and not something else. Every spectral detail of your sample is rapidly, easily, and accurately detected. Every peak is analysed with mathematical precision so you can be sure to asses the purity of peaks and confirm their identity. And you will never have to trade off resolution against sensitivity.

- The 996 PDA Detector lets you look at your results in a variety of ways – even while a separation is under way.
- Absorbance measurement over the entire 190-800 nm wavelength range.
- The MaxPlot feature of the Millennium[®] PDA Software automatically detects UV/Vis absorbing compounds anywhere within the 190-800 nm range. It measures their absorbance maxima, and plots a peak for each compound at its absorbance maximum, creating a composite chromatogram of all of the compounds it has detected.

Millennium[®] 2010 Chromatography Manager

Advanced computer technology simplifies accessing, interpreting, and reporting your results.

The productivity of today's chromatography is centered around the ability to find, generate, summarise, and report results in a way that meets your needs and complies with any regulatory requirements. The Millennium[®] relational database lets you create your own view filters to customise the way you sort your information, such as "lotCode".

- Using the database, you can track a method history giving you audit trail capability that ensures total security of your raw data and results. In addition, you can specify "Access Type" which allows you to "lock" your methods for even greater security.
- The database keeps track of your instruments, triggering an alarm when scheduled maintenance is required. The Millennium[®] relational database lets you view the injection information on any calibration point at any particular point in time on a processing sequence. This gives you a detailed account of the processing method for that injection, ensuring an accurate audit trail for regulatory compliance.
- The Millennium[®] Chromatography Manager can provide acquisition and control for as many as four chromatographic systems, including three HP5890 GC systems.
- The Millennium[®] Report Publisher has the capability to give you exactly what you want.

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The quality management system of Waters manufacturing facility, Milford, Massachusetts, complies with the International Standard ISO 9001 Quality Management and Quality Assurance Standards. Waters quality management system is periodically audited by the registering body to ensure compliance.

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