



Isolation of Glyphosate in a Broad Leaf Herbicide using ZirChrom-SAX

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Attempts at isolation using silica based columns of glyphosate, and an important process impurity, peak C, in a broad leaf herbicide are often hindered by lack of resolution, poor peak shape and short column lifetime. ZirChrom®-SAX provides baseline resolution of all process components employing an aqueous isocratic method with good peak shape and excellent column lifetime.

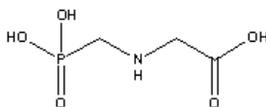


Figure 1: Structure of glyphosate

Introduction

Glyphosate [N-(phosphonomethyl) glycine] is a regulated, broad spectrum, postemergence herbicide, sold under the trade names Roundup (Monsanto Co., St. Louis, MO) and Rodeo (Dow AgroSciences, Indianapolis, IN)(1). Process testing requires the isolation of glyphosate and its impurities. Although selectivity for this analysis is improved using phosphate buffer and high pH employing these conditions may result in very short column lifetimes for silica based ion exchangers. The unique selectivity and superior stability of the ZirChrom®-SAX column allow method developers to choose the mobile phase that results in optimum selectivity without compromising column lifetime.

Experimental

A broad leaf herbicide was diluted 1:100 in mobile phase and separated at 30°C using a ZirChrom®-SAX column. The separation conditions were as follows:

Column:	ZirChrom®-SAX, 150 mm x 4.6 mm i.d. (Part Number: ZR06-1546)
Mobile Phase:	20mM Ammonium Phosphate, pH 8.5
Temperature:	30 °C with Metalox™ 200-C column heater
Flow Rate:	1.0 ml/min.
Injection Vol.:	5 µl
Detection:	UV at 254 nm

All components are well separated with good peak shape including peak D isomers and the peak C impurity peak.

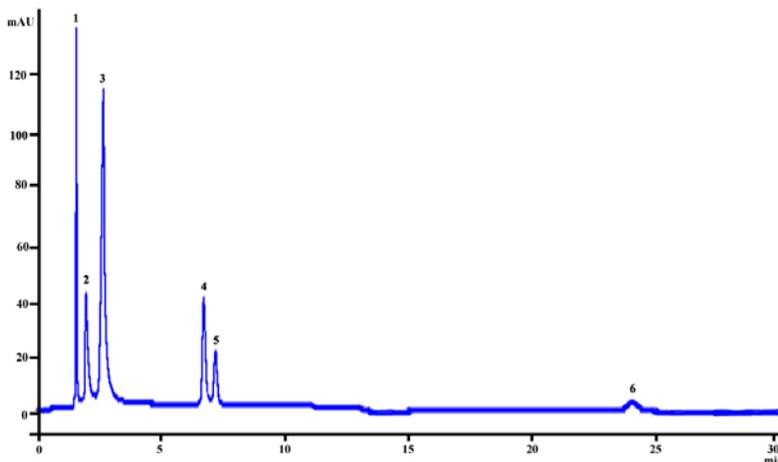


Figure 2: 1=Isopropylamine 2=Unknown 3=Glyphosate 4,5=peak D isomers 6=peak C (Impurity).

This method can be tailored to your specific application needs. ZirChrom technical support can help to optimize and transfer this method to your site. Please contact ZirChrom technical support at 1-866-STABLE-1 or support@zirchrom.com for details.

ZirChrom phases offer unique selectivity, high efficiency, and excellent chemical and thermal stability.

References

(1) *Farm Chemicals Handbook*; Berg, Gordon L. Ed.; Meister: Willoughby, OH, 1989; p C147.

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