

# Chelex<sup>®</sup> 100 Iron Form Resin for Glyphosate Clean-Up

## Introduction

Glyphosate, a popular herbicide used to destroy unwanted weeds, has been sold and marketed as Kleenup<sup>®</sup> 2 and Roundup<sup>®</sup> 3 weedkiller. Because the EPA has set limits on the concentration of glyphosate in food products and water supplies, an HPLC method using the HRLC<sup>®</sup> glyphosate analysis column has been developed for the detection of glyphosate and its breakdown product, AMPA (aminomethyl phosphonic acid).<sup>1</sup> Prior to injecting onto the column, the sample should first be cleaned up with Chelex 100 100-200 mesh resin in the iron form, and AG<sup>®</sup> 1-X8 resin 200-400 mesh in the chloride form.

## Product Description

Chelex 100 resin is a styrene divinylbenzene copolymer containing iminodiacetate ions. The iron form resin has iron (III) ionically bound to the iminodiacetate ions, which act to chelate the glyphosate from environmental water and crops such as soybeans, grapes, cabbage, and alfalfa.<sup>1</sup> Because the iron form Chelex 100 resin is of analytical grade, pre-treatment of the resin prior to sample loading is not necessary.

## Instructions for Sample Clean-up with Chelex 100 Resin

1. Transfer 15 ml of Chelex 100 100-200 mesh resin, iron form, to a column containing 7-8 ml of deionized water.
2. Apply the sample to the column and eluate at a rate of 6-8 ml/min.
3. After the elution of the sample, rinse the walls of the column and resin bed with approximately 560 ml of deionized water.
4. Rinse the column with an additional 100 ml of 0.2 M HCl, with a full open column stopcock.
5. Discard all eluates.
6. Eluate the glyphosate, at a rate of 4 ml/min or less, with 22 ml of 6 M HCl.
7. Retain only the last 15 ml of eluate and combine with 10 ml of concentrated HCl for an ion exchange clean-up.

## Instructions for Sample Clean-up with AG 1-X8 Resin

8. Prepare the column by adding 7-8 ml of deionized water and approximately 7 ml of AG 1-X8 200-400 mesh resin, chloride form.
9. Adjust the resin bed height to 5 cm.
10. Rinse the column with 15 ml of 6 M HCl immediately before applying the sample.
11. Apply the eluate from the Chelex 100 resin clean-up procedure (from step 7 above) with the stopcock full open.
12. Quickly rinse the sample container with 2 ml of 6 M HCl, and apply the rinse to the column.
13. Just as the last of the sample and rinse enters the column, apply 8 ml of 6 M HCl and collect the eluate in a 250 ml recovery flask.
14. Concentrate the eluate by drying on a rotary film evaporator, slowly increasing the temperature of the water bath from 20 to 60° C.
15. Remove the final traces of moisture with a stream of dry nitrogen.
16. Dissolve the residue in 2.0 ml of deionized water and filter through a 0.45 mm Uni-Pore<sup>®</sup> syringe filter prior to quantification of glyphosate on the HRLC glyphosate analysis column.

## References

1. Cowell, J., *et al.*, *J. Agric. Food Chem.*, **34**, 955 (1986).

Kleenup<sup>®</sup> is a registered trademark of Chevron Corporation.

Roundup<sup>®</sup> is a registered trademark of Monsanto Company.

## **Ordering Information**

<b>Catalog Number</b>	<b>Product Description</b>	<b>Package Size</b>
142-2825	<b>Chelex 100 Resin</b> , iron form, 100-200 mesh	100 g
140-1451	<b>AG 1-X8 Resin</b> , chloride form, 200-400 mesh	500 g
125-0104	<b>Glyphosate Analysis Column</b> , 300 x 4.6 mm	1
125-0106	<b>Glyphosate Analysis Column</b> , 250 x 4.6 mm	1
125-0108	<b>Glyphosate Analysis Column</b> , 100 x 4.6 mm	1
343-0112	<b>0.45 mm Uni-Pore Filter</b>	50

© 1990 Bio-Rad Laboratories.  
All Rights Reserved.