Sample Preparation of Glyphosate and Glufosinate by Solid-Phase Anion Exchange Extraction (N-phosphonomethyl glycine) and *RS*)-2-amino-4-(hydroxyl-methyl-phosphoryl)butanoic acid

Part Number: EUQAX2M6

September 30, 2009

Glyphosate, (CAS 1071-83-6) known principally as Roundup®, and glyfosinate (CAS 51276-47-2) (Basta®, Challenge®) are known as broad spectrum, nonselective systemic herbicides that are absorbed through the leaves of plants. These herbicides are used in many countries throughout the world because of their effectiveness at killing grass, broadleaf and woody plants.

Sample preparation can be achieved using the UCT ENVIRO-CLEAN® anion exchange cartridge EUQAX2M6. For this procedure, a 1 liter water sample is raised to pH 6 or more to ionize the analytes. The sample is drawn through the cartridge which captures the analytes of interest followed by elution with acidified methanol.

1) **Sample Conditioning**
   a) Adjust water sample pH to 6 or higher

2) **Cartridge Conditioning**
   a) Add 5 mL of methanol to the cartridge
   b) Draw methanol through with vacuum leaving enough to cover surface of sorbent
   c) Rinse the cartridge using 10 mL of reagent water

   Note: Do not let the cartridge dry out after addition of methanol

3) **Extraction Protocol**
   - Draw a known volume of pH adjusted sample water through the cartridge

   Note: Sample volume is determined by the quantitation limit

   - Adjust vacuum so that flow is approximately 1 - 3 mL per minute
   - Rinse cartridge using 10 ml of reagent water
   - Dry the cartridge by drawing full vacuum for 10 minutes

4) **Analyte Elution**
   a) Elute using 4 mL of 1 mol/L HCl/methanol solution (4/1)
   b) Add eluant to the cartridge then draw through at 1 mL/minute
   c) Evaporate to dryness with N_2 flow in a water bath heated to 50°C

5) Analysis

Analysis of glyphosate and glufosinate is conducted using GC/MS

a) Add 50 µL of N-methyl-N-(tert-butyldimethylsilyl) triflouroacetamide (MTBSTFA) and 50 µL of dimethylformamide for derivatization
b) Sonicate at room temperature for 2 minutes
c) Transfer to GC vial insert and cap
d) Heat to 80°C for 30 minutes
e) Cool to room temperature and analyze by GC/MS

UCT, LLC • 2731 Bartram Road • Bristol, PA 19007 • 800.385.3153 • 215.781.9255 • www.unitedchem.com • Email: methods@unitedchem.com