



Recovery of Various Herbicides in Water Using UCT ENVIRO-CLEAN® Universal C18 Solid-Phase Extraction Cartridges

Product Number: ENVIRO-CLEAN® Universal C18 cartridge ECUNIC18

The GC analysis of select phenoxy acid based herbicides found in various surface waters may be easily determined by the use of this procedure. Herbicides DCPA (Dathal), MCPP (Mecoprop), Dicamba, MCPA, Dichloroprop, 2,4-D and 2,4,5-TP (Silvex), 2,4,5-T, Dinoseb, 2,4-DB, common household weed killers are evaluated using this method.

1. Vacuum Manifold Set-Up

- a) Assemble a disk manifold vacuum extraction apparatus
- b) Install an 83 mL C18 ENVIRO-CLEAN® Universal cartridge

Note: All glassware must be acid rinsed with dilute sulfuric acid

2. Sample Preparation

- a) Adjust the pH of a 500-1000 mL water sample to 2.0 ± 0.5 with 6N HCl
Use of a pH meter is highly recommended over pH paper

3. Cartridge Conditioning

- a) Add 5 mLs of methanol to the cartridge
- b) Draw a few drops through until methanol touches top of frit
- c) Hold for 1 minute
- d) Rinse cartridge with 15 mLs of water adjusted to pH 2 with 6N HCl

Note: Do not let the cartridge dry out at this point otherwise repeat conditioning step

4. Sample Extraction

- a) Adjusting the vacuum setting such that flow is about 25 mLs per minute
- b) Draw the water sample through the cartridge
- c) Draw air through the cartridge under full vacuum for 5 minutes to dry the cartridge
- d) Tap the cartridge to help remove excess water. **DO NOT OVERDRY**

5. Elution

- a) Insert a collection tube containing 2 grams of acidified sodium sulfate (see UCT publication*)
- b) Add 10 mLs of methanol to the sample bottle and swirl
- c) Add to cartridge

6. Analyte Elution

- a) Elute cartridge using 8 mL of methanol
- b) Repeat with a second aliquot of methanol
- c) Add 5 mLs of methylene chloride to the sample bottle and rinse
- d) Add to cartridge
- e) Elute cartridge using 5 mL of methylene chloride (CH_2Cl_2)
- f) Repeat with a second aliquot of methylene chloride and add to e)

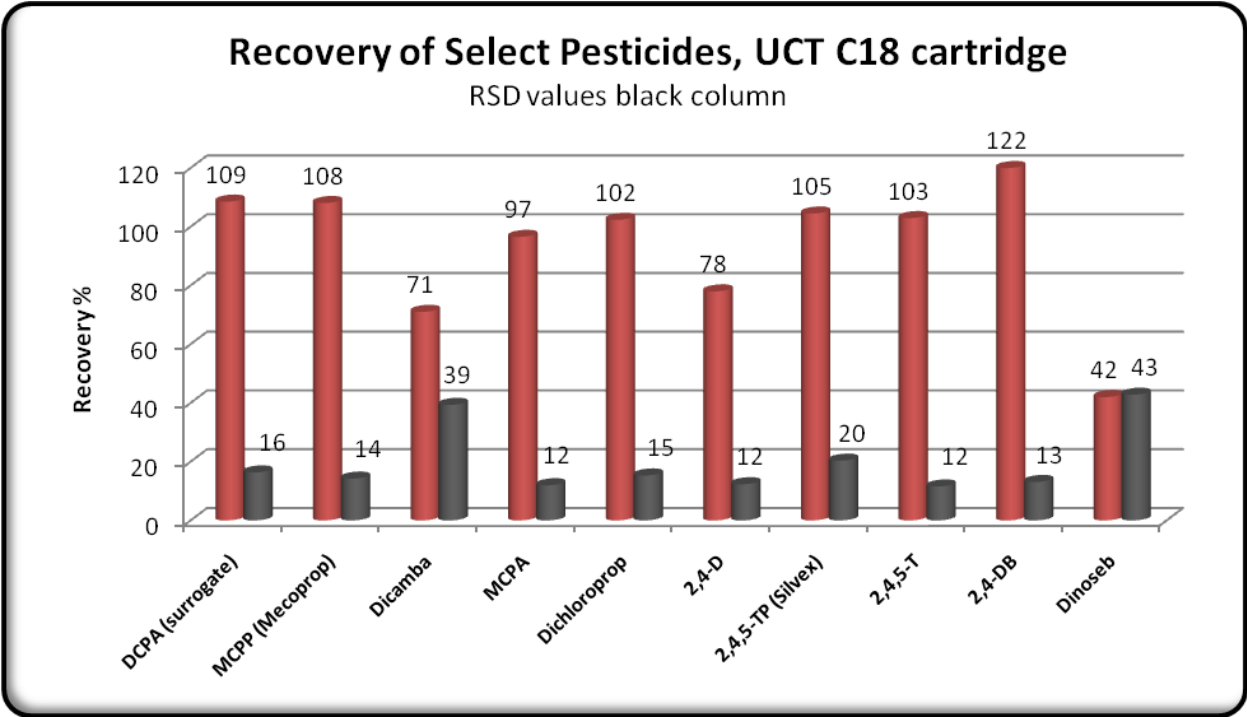
7. Concentration and Exchange

- a) Derivatize 1 mL from step 6.f) with diazomethane
- b) Exchange into 1 mL hexane

Methylation is detailed in EPA Method 8115 or 515. Extract must be very dry otherwise methylation may be incomplete

Herbicide Data Table

Pesticide	CAS	UCT C18	% SD
DCPA (surrogate)	1861-32-1	109	16
MCPP (Mecoprop)	93-65-2	108	14
Dicamba	62610-39-3	71	39
MCPA	94-74-5	97	12
Dichloroprop	120-36-5	102	15
2,4-D (amine salt)	2008-39-1	78	12
2,4,5-TP (Silvex)	93-72-1	105	20
2,4,5-T	93-76-5	103	12
2,4-DB	94-82-6	122	13
Dinoseb	88-85-7	42	43



* Procedure for Preparing Acidified Sodium Sulfate Anhydrous from EPA Method 8151A 5.10, Product Number: UCT brand sodium sulfate ECSS25K