



# One Step Extraction, Cleanup and Concentration for Pesticides in Soil

## Introduction

Pesticides are classes of chemicals that are used to treat or control outbreaks of pests, especially insects. Food production as well as safety and health organizations heavily rely on pesticides to increase food yields and / or control disease outbreak spread by insects. Some pesticides have proven hazardous to other animals or the environment and have either been restricted or banned. The need to monitor products, especially foods, for pesticides is essential as more pesticides are being discovered to have adverse effects. One class of commonly used pesticides is chlorinated pesticides. These compounds are commonly detected using EPA Method 8081. This method determines the concentrations of various organochlorine pesticides in extracts from solid and liquid matrices, including food products, using gas chromatography with electron capture detectors (ECD). This application provides a unique new option to speed up multiple sample prep processes into one. The FMS PLE (pressurized liquid extraction) system will automatically perform the extraction and sample cleanup using the FMS proprietary in cell column and deliver the extract for final concentration to be injected directly by the GC system. This is a first for analyzing chlorinated pesticides by EPA Method 8081

## Instrumentation

- FMS, Inc. Power Prep PLE (pressurized liquid extraction) System
- FMS, Inc 5gm Acidic InCell Silica Column
- FMS, Inc. PowerVap Concentrator
- Thermo Fisher Scientific Polaris Q GCMS

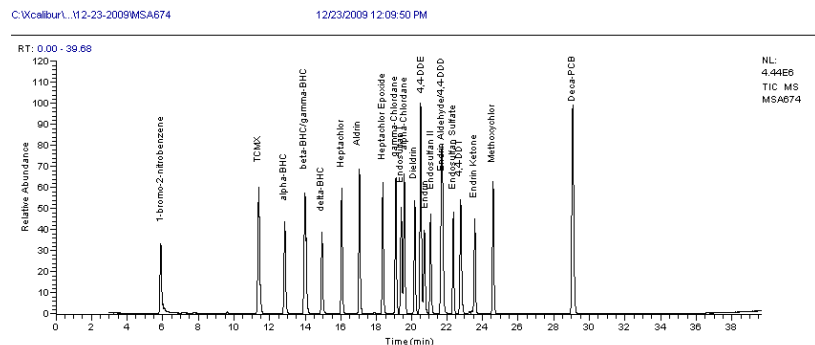
## Method Summary

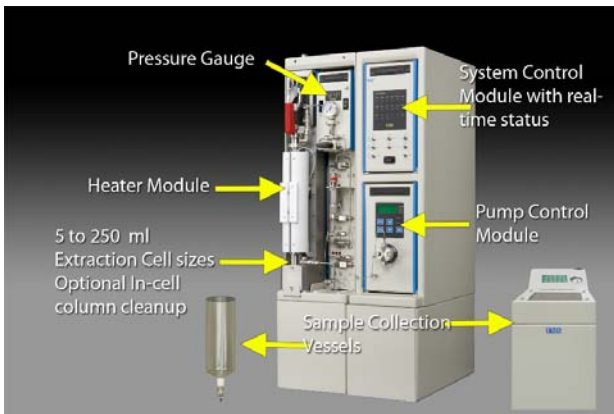
### PowerPrep PLE

1. Extraction solvent: Hexane
2. Extraction temperature: 100C
3. Extraction pressure: 1500 PSI
4. Extraction time: 20 minutes

## Results

Compound	Recovery (ug/ml)	Recovery
TCMX	4.77	95.4%
Alpha-BHC	4.57	91.4%
Beta-BHC	4.44	88.8%
Gamma-BHC	4.44	88.8%
Delta-BHC	4.46	89.2%
Heptachlor	4.68	93.6%
Aldrin	4.26	85.2%
Heptachlor Epoxide	4.75	95.0%
Gamma-Chlordane	4.23	84.6%
Endosulfan	4.39	87.8%
Alpha-Chlordane	4.22	84.4%
Dieldrin	4.65	93.0%
4,4'-DDE	4.33	86.6%
Endrin	5.2	104.0%
Endosulfan II	5.14	102.8%
Endrin Aldehyde	5	100.0%
4,4'-DDD	4.55	91.0%
Endosulfan Sulfate	4.55	91.0%
4,4'-DDT	4.67	93.4%
Endrin Ketone	4.8	96.0%
Methoxychlor	5.11	102.2%
Deca-PCB	5.37	107.4%





**PowerPrep PLE (pressurized liquid extraction) System**

## ***Conclusion***

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The FMS PowerPrep/PLE system in combination with the FMS 2.5 gm Florisil In Cell column and FMS PowerVap is shown to automatically Extract, Cleanup and Concentrate samples at a high rate of speed producing excellent recoveries and reproducibility. The combination of the FMS PowerPrep PLE system and the FMS Teflon In Cell column demonstrates consistent, reproducible, reliable high throughput for Automated One Step Sample Preparation of Soils for the analysis of Pesticides. The PowerPrep PLE system can automatically and unattended Extract, Cleanup and Concentrate up to 6 samples per hour.

For more information on the [PowerPrep PLE system](#)

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