

NanoPak-C All Carbon solid phase extraction (SPE) of Organochlorine Pesticide from Trace Amounts of Environmental Samples

Aim: Develop and validate a reliable SPE method using NanoPak-C All-Carbon microbeads to isolate 15 OCPs from small quantities of soil (100 mg) and river water (200 μ L) samples.

Instrumentation

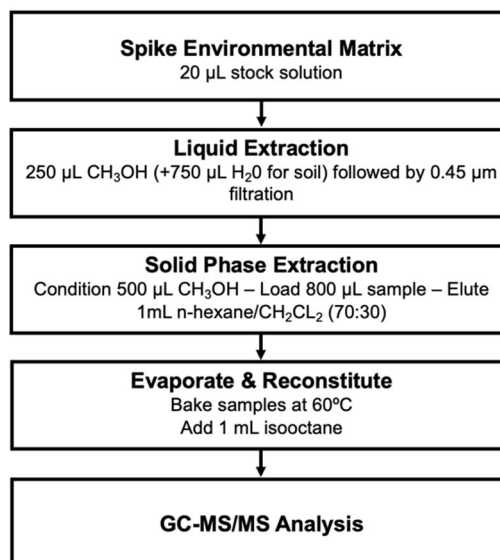
GC Conditions	
System	Agilent GC-7890B
Column	DB-5ms Ultra Inert (5m • 250 μ m • 0.25 μ m)
Carrier gas	Helium
Carrier gas flow rate	2.25 mL/min
CID gas	Nitrogen
CID gas flow rate	1.50 mL/min
Injection type	Split-less
Injection volume	2 μ L
Injection temp	280 °C
Oven program	60 °C for 1 min, ramp to 170 °C at 40 °C/min run for 3.75 min. Ramp to 310°C at 10°C /min run for 20.75 min.
MS Conditions	
System	Agilent MS-7000D
Source temp	280 °C
Transfer line temp	280 °C
MS1 & MS2 quad temp	150 °C
Run mode	electron ionization (EI)
Electron energy	70 eV
Scanning range	10 - 500 amu

Probe Analytes

EPA Pesticide Mix product No. 48858-U (Supelco Merck, USA)

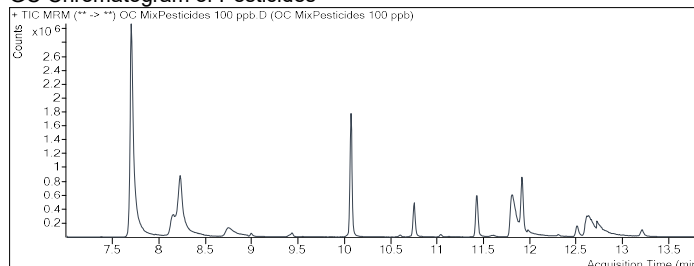
Name of OCP	Retention Time (min)	Collision energy (eV)
ALPHA-BHC	7.74	5,20,40,45
BETA-BHC	8.10	20,45,5,40
GAMMA-BHC	8.27	5,20,40,45
DELTA-BHC	8.72	5,20,40,45
HEPTACHLOR	9.50	10
ALDRIN	10.14	25,30,40,10
HEPTACHLOR EPOXIDE	10.82	10
ENDOSULFAN I (ALPHA)	11.50	15,25,35
4,4'-DDE	11.83	45,30,45,15
DIELDRIN	11.99	25,30,40
ENDRIN	12.38	30,25,40
4,4'-DDD	12.60	20,30
ENDOSULFAN II (BETA)	12.59	30,45
4,4'-DDT	13.30	20,30
ENDOSULFAN SULFATE	13.60	15,45

Methods

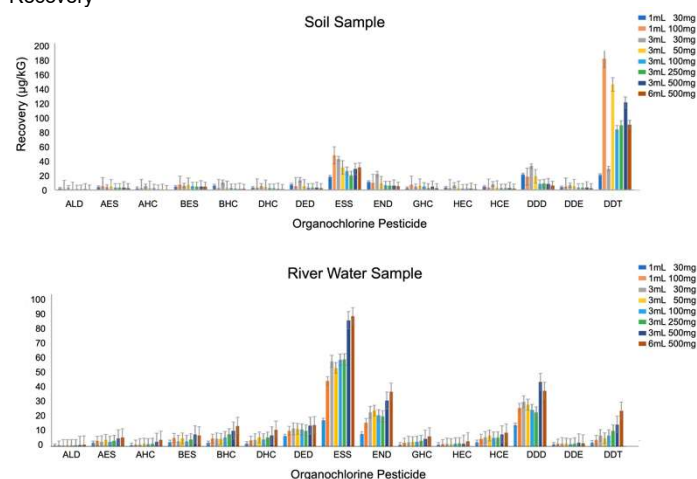


Results

GC Chromatogram of Pesticides



Recovery



Average pesticide recovery from river water is reported from 68.79 ± 8.01 through 275.15 ± 67.61 (μ g/kg) across the six tested SPE bed weights. Recovery from soil samples ranges from 117.15 ± 42.52 through 158.85 ± 101.5 (μ g/kg) across the six tested SPE bed weights.