

Automated Solid Phase Extraction of Organic Compounds from Marine Sediments, Soil, and Dust Samples

Introduction

The extraction and segregation of Organic compounds from core samples taken from marine sediments is used to predict climate conditions, reconstruct sea temperatures and identify the type of vegetation from the C3 (Temperate climate) and C4 (Tropical Climate) isotopic mass spectroscopy ratio analysis.

Biomarkers like Alkenones (2-nonadecanone) are produced by marine algae, tetra ethers are produced by bacteria and other n-Alkanes, Sterols, and fatty acids are all used to chart temperature changes over hundreds of years. If the Alkane chains have more double bonds then there is a linear relationship that shows lower the sea temperature.

Instrumentation Used for Sample Preparation



The RapidTrace
for Automated
SPE



TurboVap LV for Automated
Sample Evaporation

Sample Preparation

A dry ground sample of sediment or soil is extracted with Dichloromethane & Methanol (99:1) at 100 deg C, 1000psi using a Dionex ASE - 200. This extract can be concentrated by evaporation using the TurboVap LV ASE model that can take 24 x 40ml ASE tubes. The concentrated extract is then saponified with 0.3M Methanolic KOH and the neutral fraction extracted into Hexane. Hexane and DCM mixes can also be used for extraction. In order to obtain a flat baseline that is free from interferences it is necessary to do an SPE clean up and collection of 4 fractions. This is done using the Rapid Trace and utilizes a **3ml Silica Gel Column** with 1g of packing.

The RapidTrace Method

All solvent lines are purged & primed with solvent first. A maximum of 8 solvents can be used to run a wide range of methods. The instrument sample rack has two rows of 10 test tubes 16mm x 100mm for holding the samples and Eluent fractions. This method offers an automated rugged and reproducible solution for cleaning up the samples to remove interferences. The Eluent fractions collected can be evaporated for concentration using the TurboVap LV system with a 50 position 16 x 100 rack.

STEP	SOURCE	DESTINATION	VOLUME (ML)	FLOW (ML/MIN)
Condition	Dichloromethane	Chlorine Waste	3	15
Condition	Hexane	Organic Waste	5	15
Load	Sample	Organic Waste	1	0.5
Collect	Hexane	Fraction 1	2	1
Collect	Hex : DCM 2:1	Fraction 2	1.5	1
Collect	Dichloromethane	Fraction 3	3	1
Collect	DCM:MeoH	Fraction 4	3	1
Collect	Methanol	Fraction 5	2	1 (Optional)
Purge Cannula	DCM	Cannula Waste	2	30
Purge Cannula	Hexane	Cannula Waste	2	30

Common Reagent Table for All Methods

LINE NO.	REAGENT NAME	SIP SPEED (ML/MIN)
1	Hexane	30
2	Dichloromethane	30
3	Hexane : DCM (2:1)	30
4	DCM : MeOH (95:5)	30
5 (Optional)	Methanol	30

WASTE NAME	ABBREVIATION	
Aqueous Waste	Aq W	Air Push = 2ml
Organic Waste	Org W	Air Push Multiplier = 2
Cannula Waste	Cannula	
Chlorinated Waste	CL W	

Ordering Information

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