Empore™

Anion Exchange-SR Extraction Disks for Environmental Analysis

For use with 47 mm and 90 mm extraction apparatus

Instructions for Use

Note: Empore Sample Preparation Products are intended for solid phase extraction during scientific research only. These products are not intended for use in medical devices or in assessment and treatment of clinical patients.

General Product Characteristics

Description:
Empore Anion Disks are a unique product for the solid phase extraction of anionic analytes, such as Endothall, Dalpon and haloacetic acids from aqueous samples. A proprietary process is used to entrap adsorbent particles into a matrix of inert PTFE to create a mechanically stable sorbent disk.

Formulation:
90% or greater adsorbent particle
10% or less PTFE

Product Characteristics:
Thickness: 0.5 mm ± 0.05 mm
SPE Flow Rate: < 10 min/L DI H₂O @ 25°C
@ 20 in. Hg (47 mm disk)
Solvents: Compatible with all organic solvents
pH: Stable between 1 and 14.
Ionic Form: Chloride
Suggested Application Procedures

General: Water Analysis

Empore™ Extraction Disks provide an efficient alternative to liquid/liquid extraction for sample preparation. A proprietary process is used to entrap adsorbent particles into a matrix of inert PTFE to create a mechanically stable sorbent disk. The disks can be used for purification and concentration of analytes for analysis. Advantages of Empore Extraction Disks include rapid filtration, reduced solvent usage and a reduction of analytical interferences.

The enclosed instructions are general guidelines for use. Sample volume, solvent type and conditioning may be changed to adapt to specific methods and analytes as needed.

Extraction Equipment

- 47 mm or 90 mm Empore Extraction Disks.
- 47 mm or 90 mm glass filtration apparatus.
- Vacuum source.

Sample Preparation

- Adjust sample pH as necessary to ensure that analytes are ionic. A general rule of thumb is to raise sample pH at least two units above the pKₐ of the analytes being extracted.
- Dilute sample with water as needed to reduce ionic strength to <0.1 M.
Sample Preparation (continued)

- Filter Aid 400 (Cat. # FA400) and/or prefiltration may be helpful if the sample contains excessive suspended solids.

Suggested Vacuum Apparatus

Note: Suggested solvent volumes will vary according to the disk diameter and the amount of Filter Aid 400 filter material. A general guide for solvent volumes is to completely cover the disk and bed of filter material, such that 2 - 3 mm of solvent is above the surface. Repeat with second aliquot.
Extraction Disk Conditioning

Disk conditioning is critical for a successful extraction. Conditioning provides a good interface between the sorbent and the sample matrix. **FAILURE TO CONDITION THE EXTRACTION DISKS PROPERLY WILL RESULT IN ERRATIC AND LOW RECOVERIES.**

1. Center the extraction disk on the base of the filtration apparatus and clamp the reservoir on top of the disk.*

2. Wash the disk with 10 mL of acetone or other solvent. Apply vacuum and dry the disk.

3. Add 10 mL methanol to the disk. Apply vacuum and pull approximately 1 mL through the disk. Vent the vacuum and allow the disk to soak for 30 seconds before reapplying vacuum. Pull the methanol through the disk until it is just above the surface of the extraction disk. This step should be followed by the following sequence of solvents in 10 mL aliquots: Reagent water, 1 M Sodium Hydroxide, Reagent water.

Note: When using solvents or other chemicals, be sure to read and follow the manufacturer’s precautions and directions for use.

The conditioning solutions can be pulled through the extraction disk at full vacuum. **DO NOT ALLOW THE DISK TO DRY.** Always leave 3-5 mm of liquid above the surface of the disk. **If disk becomes dry while conditioning with the above solutions, repeat Step 3.**

* Place a vial in the vacuum apparatus to collect and dispose of wash and conditioning solvents. Remove vial prior to sample extraction.
Sample Extraction

- Pour the sample into the reservoir and apply vacuum. Recoveries are not affected by flow rate. Flow rate is dependent on vacuum source and solids content of the sample.

- After sample extraction is complete, remove residual water from the disk by applying vacuum to dry the disk for 5-20 minutes.

Sample Elution

Two elutions with 10 mL solvent are recommended. Smaller volumes of solvent may be used if the elution technique has been optimized. Elution can be enhanced by the selection of a high selectivity counterion, high ionic strength solution and a pH adjustment to 2 units lower than the pKₐ of the analytes being extracted. Very strong acids such as sulfonates may be difficult to elute from anion exchange disks.

- Place tip of filter base into the collection vessel (see diagram).

- Add 10 mL elution solvent to sample container, rinsing down the sides. Transfer solvent from sample container to reservoir with a pipet, washing the walls of the reservoir in the process.**

- Apply vacuum and pull approximately 1 mL elution solvent through the disk. Vent the vacuum and allow the disk to soak 30 seconds before reapplying vacuum to dry the disk.

- Repeat the above process with a second aliquot of eluting solvent.

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Sample Elution (continued)

** An intermediate wash with methanol or another organic solvent will remove neutral organics. Recovery will not be reduced by this step. If all liquid has left the surface of the disk, re-wetting with a minimum amount of methanol will be necessary.

General Information

Handling and Storage

The disks may be handled in the same manner as any filter membrane. Because of the adsorptive properties of the disk, desiccator storage away from laboratory air at room temperature is recommended.

Recommended Usage

Empore™ Extraction Disks are used in a manner similar to membrane filters. Filtration equipment is available from a number of different suppliers and include in-line filter holders, glass filtration apparatus, and multiple filtration manifolds. Buchner funnels are not recommended.

Applications

Empore Extraction Disks are used for extraction of anionic analytes, such as Endothall, Dalpon and haloacetic acids from water samples or soil extracts.
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