



## General Information

### Handling and Storage

CDS Analytical Empore™ Cesium Rad Disks are unique products. The disks may be handled in the same manner as any sorbent membrane. The disk should be stored in a dry place at room temperature.

### Suggested Usage

Empore™ Cesium Rad Disks are available with a diameter of 47 mm. Disks fit into existing single or multiple station vacuum manifolds and into 50 mm planchet for use with proportional counters.

### Disposal

Dispose of used disks according to standard radiochemical procedures and regulations. Unused disks may be disposed of in accordance with standard procedures for laboratory waste.

## More Information

### Ordering and Customer Service\*

Within United States: Phone 610-998-4059

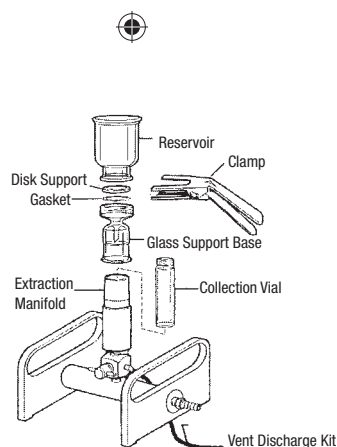
### Technical Service\*

Within United States: Phone 610-998-4059

### Internet

[www.cdsanalytical.com/empore](http://www.cdsanalytical.com/empore)

*\*for contact information outside the United States, please refer to internet site.*



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# Empore™ Cesium Rad Disks

*for the selective separation and counting of cesium*

## Instructions for Use

### General Product Characteristics

#### Description

CDS Analytical Empore™ Cesium Rad Disks are unique products that effectively replace conventional radiochemical sample preparation methods that use wet chemistry or packed columns. Empore Cesium Rad Disks combine Empore membrane technology with potassium cobalthexacyanoferrate crystals to selectively adsorb dissolved cesium in the presence of other common ions. Cesium may be counted directly from the surface of the disk.

#### Composition

- 90% ± 2% Sorbent
- 10% ± 2% PTFE

#### Product Characteristics

- Diameter: 47 mm (nominal)
- Thickness: 690 μm (0.027 in.)
- Flow Rate: 4 – 10 min./L/disk @ 500 mm Hg (using standard 47 mm vacuum manifold)

#### Disk Identification

- Element specificity: Cs
- Unique Disk identification number
- Lot number

*CDS Analytical 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. CDS Analytical does not warrant the use of these products for any application outside of the product's intended use.*



## Safety Information

|                 |                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------|
| <b>WARNING:</b> | Indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
|-----------------|-------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>WARNING:</b>                                                                                                                                                                                                                   |
| <b>To reduce the risks associated with environmental contamination, handling radiochemical materials or false negative results:</b>                                                                                               |
| <ul style="list-style-type: none"><li>Read, understand and follow all recommendations in the product MSDS and Instructions for Use.</li></ul>                                                                                     |
| <b>To reduce the risks associated with radiochemical materials:</b>                                                                                                                                                               |
| <ul style="list-style-type: none"><li>Always wear the proper PPE (Personal Protection Equipment) when handling used product.</li></ul>                                                                                            |
| <b>To reduce the risks associated with false negative results for radiochemicals:</b>                                                                                                                                             |
| <ul style="list-style-type: none"><li>Always use the Empore™ Cesium Rad Disks by the expiration date.</li></ul>                                                                                                                   |
| <b>To reduce the risks associated with environmental contamination:</b>                                                                                                                                                           |
| <ul style="list-style-type: none"><li>Dispose of used disks according to standard radiochemical procedures and regulations. Unused disks may be disposed of in accordance with standard procedure for laboratory waste.</li></ul> |

## Scope and Application

This disk is intended for determination of radioactive cesium in aqueous samples. Using Empore™ Cesium Rad Disks, sample processing and counting source preparation may be condensed into a single step. This preparation takes approximately 20 minutes for a one-liter sample and is amenable to batch-processing. Total Cs content should not exceed 10 mg to obtain quantitative recovery. For typical one-liter samples, Cs retention is greater than 95%. The method detection limit depends on sample volume and counting protocol but generally will be in the range of 5 – 10 pCi/L (200 – 400 mBq/L).

## Interferences

When analyzing samples via gamma counting, interferences should not occur, as emitting species can be identified by their specific energies. When analyzing samples via low-background gas proportional counting care must be exercised in assuming that only cesium-137 is present, as low-background counting records all beta emissions. Potential radiometric interferences captured by the cesium disk include cobalt-60, strontium-90, barium-133, radium-226, and uranium-238.

## Apparatus and Materials

- 47 mm Empore Cesium Rad Disks
- 47 mm single- or multiple-station vacuum manifold
- Low background gas flow proportional counter or gamma spectrometer
- 50 mm planchets

## Reagents

No reagents are required for this procedure.

## Sample Collection, Preservation and Handling

No special collection, preservation or handling steps are necessary for this procedure. No “wetting” of the disk with methanol or other alcohol is necessary.

## Disk Loading Procedure

- Measure the sample volume. Depending on the activity present and the analytical detection limit required, this may vary from 100 mL or less to several liters.
- If there is particulate matter present in the sample, use a prefilter to remove any potential beta emitting interfering solids.
- Mount an Empore Cesium Rad Disk in the filter support.
- Pull the sample aliquot through the disk at a nominal flow rate of 50 mL/min. No adjustment of pH or wetting of the disk is necessary.
- Remove disk from loading apparatus and either dry (if analyzing by beta counting techniques), or count directly (if analyzing by gamma spectrometry).

## Counting Options

Disks may be counted by either gas proportional counting or gamma spectrometry. Liquid scintillation counting of the Cesium Rad Disk is generally not recommended because of the dark disk color.

For use with a gas proportional counter, rinse the disk with 5 mL of acetone while it is still in the manifold and then let air dry. Alternatively, remove the disk from the manifold and dry in a 60 °C oven for 30 minutes. Note: be sure to correct for potassium-40 emissions from the cesium disk. Prepare a blank using the RLS and a sample volume of deionized water equal to that of your sample, up to 1.0 Liter.

When analyzing by gamma spectrometry, the disk may be transferred from the loading apparatus and counted directly (no drying step required).