SCP SCIENCE

*Digi*SEP Red

SPE CARTRIDGES

SOLID PHASE EXTRACTION

SPE (Solid Phase Extraction) is a technique whereby a desired analyte, a cation or an anion, is concentrated and separated from a complex sample matrix onto a sorbent stationary phase. The interfering matrix, which is not retained, is effectively eliminated. As a result, the analyte can be analyzed at the best possible sensitivity range of the analytical technique, e.g. Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES), without the risk of matrix interference.

In recent years another technique has become very popular, the technique of Matrix Component Retention. In this case, the sorbent is selected to retain unwanted components in the matrix and the analytes of interest are not retained. Again, because the potentially interfering components have been removed, better sensitivity is obtained in sample analysis. This technique is seen most often in the food industry.

KEY FEATURES OF SPE CARTRIDGES:

*Digi***SEP** Red is a strong anion exchanger, bearing a tetralkylammonium group. It can be used for the elimination of interferences or preconcentration of metal ions.

Elimination of interferences
Some ions recombine in the plasma giving rise to false readings. If the metal ion has a negative charge and the interferences have a neutral or positive charge, it is possible to immobilize the metal and wash off the matrix.

Preconcentration
Some instruments are not sensitive enough to provide reliability in trace metal analysis. It is possible to immobilise a metal anion from a large sample and elute it in a smaller volume. Concentration factor of 10 to 100 are easily obtained.

*Digi***SEP** Red is shipped in its chloride form. It is necessary to activate the product by exchanging the chloride ion for a hydroxide which is more easily displaced by other anions.

Other ions present in solution will compete or prevent the analyte from interacting with the binding sites. For this, total ionic strength of the solution to extract should not exceed 0.1 M.

Base Material: poly(methylmethacrylate)

Functional Group: alkyltrimethylammonium chloride

Exchange Capacity: 0.55-0.66 meq/g
(-1, -2, -3 species account for 1, 2 and 3 equivalents respectively)

Bed volume = grams of sorbent x 2 mL/g

ICP-AES
ICP-MS
AA
SCP SCIENCE
XRF
Sample Prep
www.scpscience.com

Sample Prep

ICP-AES & MS

AA

XRF

Calibration Standards

Certified Reference Materials

*Plasma***PURE Acid**

- Manufactured with trace metal levels less than 10 ppt (0.01 ppb)
- Complete with a detailed Certificate of Analysis

*Digi***PREP MS**
No. 010-500-205

- Digest samples while eliminating sample contamination from digestion system
- Teflon® coated graphite block and acid resistant Kydex exterior construction

USA
Tel.: (800) 361-6820
Fax: (800) 253-5549

Canada / International
Tel.: (800) 361-6820 / (514) 457-0701
Fax: (800) 253-5549 / (514) 457-4499

Europe
Tel.: +33 (0)1 69 18 71 17
Fax: +33 (0)1 60 92 05 67

*Digi*SEP Red ANION EXTRACTION CARTRIDGES

Description	Particle (µm)	Surface (m^2/g)	Quantity	Catalog Number
*Digi*SEP Red, 100 mg / 3 mL	60 - 75	220 - 270	50 per box	010-700-026
*Digi*SEP Red, 250 mg / 6 mL	60 - 75	220 - 270	25 per box	010-700-028
*Digi*SEP Red, 500 mg / 6 mL	60 - 75	220 - 270	25 per box	010-700-030

*Digi*SEP SPE CARTRIDGE PROCEDURE

SAMPLE SIZE

Sample size can be as high as 1,000 mL. The volume depends on the concentration of the product to immobilize. To ensure that the analyte does not break through the SPE, use a sample volume that does not contain more than $^2/_3$ of the nominal exchange capacity. Flow rate must not be above 1 mL/min due to the relatively slow kinetics compared to other capture modes. Delivery of the solution can be performed automatically with a SPE manifold equipped with a pump and tubing system. Flow rate can be reduced to improve contact time and thus retention efficiency.

1. Conditioning

- **2-3 bed volumes of 2 N HNO_3 *Plasma*PURE**
- **5 bed volumes of deionized water**
- **5 bed volumes of 1 N NaOH**
- **5 bed volumes of deionized water**

Drain the cartridge under vacuum before changing solution. Better separation is obtained when the SPE is equilibrated using a solution that mimics the matrix of the sample (a calibration blank could be used for this purpose). If this is not possible, use a solution that has similar ionic strength.

2. Impurities removal

- **5 bed volumes of demineralised water or solvent matrix**

3. Elution of the analyte

Elution of the analyte is done by mass action, i.e. the displacement by a low selectivity anion present in high concentration, typically > 0.2 M.

- **2-3 bed volumes of 2 N HNO_3 *Plasma*PURE**

For improved recovery, use one aliquot of one bed volume at a time. Drain under vacuum at 1 mL/min. If poor recovery is observed, increase acid concentration.

4. Analysis of the sample

- **Adjust to desired volume before analysis on ICP or AA**

5. Regeneration of the cartridge

- **Same as conditioning**

*Digi*SEP REAGENTS

Description	Conc.	Volume	Catalog Number
Nitric Acid, HNO_3	2 N	500 mL	250-037-130
Sodium Hydroxide	1 N	500 mL	250-108-400

Description	Volume	Catalog Number
Deionized Water, ASTM Type 1 (18 Megohm/cm)	500 mL	140-113-035

*Digi*SEP PROMOTIONS*

Description	Quantity	Catalog Number
Digi*SEP Red Starter Kit 250 mg/6ml	2/pk	010-702-028
Digi*SEP Sample Vacuum Kit	1	010-720-150

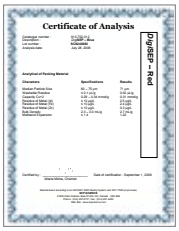
** One time offer*

*Digi*SEP ACCESSORIES

SPE Vacuum Manifold Set
No. 010-790-501

Excess Liquid Collection Vessel with Pump Tubing
No. 010-790-503

Vacuum Pump
No. 010-790-509



***Digi*SEP Red Starter Kit 250 mg/6ml**
No. 010-702-028

***Digi*SEP Sample Vacuum Kit**
No. 010-720-150