

Maxi-Clean™ IC-RP SPE Cartridges

Introduction

Maxi-Clean™ Ion Capture Devices are solid-phase extraction devices used to eliminate matrix interferences from samples prior to analyses by LC, IC, or GC. Each device consists of either 0.5mL or 1.5mL of polystyrene-based packing sandwiched between polyethylene frits within an injection-molded medical-grade polypropylene housing (Figure 1).

Samples and wash solvents are passed through the packing using a luer hub syringe. As sample comes in contact with the packing, specific chemical interactions take place which selectively retain certain components of the matrix in the device while the remaining components pass through the device outlet.

Successful application of IC devices requires:

- 1) proper conditioning of the device prior to sample application,
- 2) application of the sample at a rate slow enough to allow the chemical interaction to take place while the sample is in the device, and
- 3) control of sample size to keep within the device's capacity.

The following information provides general recommendations for the use of IC-RP devices. This procedure may be modified to accommodate samples with different characteristics.

General Information

Maxi-Clean™ IC-RP devices provides a reliable method for the removal of hydrophobic components from aqueous samples prior to analysis by ion chromatography. IC-RP devices contain either 0.5mL or 1.5mL of hydrophobic porous polystyrene packing. Hydrophobic components of the sample are retained in the packing by reversed-phase mechanisms. Polar organics and inorganic anions and cations are not retained. The net result is removal of hydrophobic components from the matrix while polar components pass through the cartridge intact. This mechanism may be used to remove surfactants, organic acids, proteins and other organic substances.

Flow Rate

The devices have a number of flow-dependent parameters that may affect results. In general, high flow rates, particularly in the sample loading step, will decrease the performance while low flow rates will improve the extraction process. Low flow rates allow the sample to diffuse into the packing thus increasing capacity and improving the efficiency. The recommended flow rate for sample loading is 1mL/minute or less.

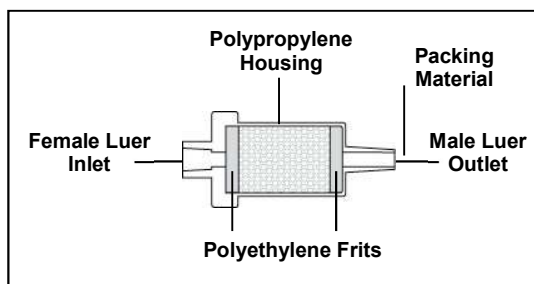


Figure 1

Sample Mass

Each device capacity is dependent on the nature of the sample components and on the matrix solvent. Sample components with the greatest degree of hydrophobicity and with net neutral charge will exhibit the highest capacity. In addition, capacity is enhanced when the matrix solvent is aqueous. Device capacity may be determined experimentally by passing a large volume of sample through the device and collecting the eluate in 1mL fractions. Assay each fraction for the contaminant. The device capacity is defined as the amount of sample that may be applied before the contaminant appears in the eluate. Best routine results are obtained when sample size is adjusted to use 50% or less of the device capacity.

Sample Volume

The internal volumes of the different devices include the flow passages and interstitial packing volume. Although it is possible to recover all but 100µL (for the 0.5mL devices) or 150µL (for the 1.5mL devices) of sample with an air purge, best results are obtained when the sample volume greatly exceeds the internal volume of the cartridge.

General Procedure

- 1. Precondition the Device.** Pass 5 to 10mL of HPLC grade methanol through the device. This removes interstitial contaminants and wets the packed bed. Follow this with 5 to 10mL of IC grade water. For trace analysis work, repeat this procedure until the water rinse is free from interferences.
- 2. Load the Sample.** Load the entire sample at 1mL/minute or less. The total amount of contaminant contained in the sample should not exceed the device capacity and preferably should be below 50% of total capacity. Discard the first 1mL of eluate. Collect the remaining eluate for analysis.

Other IC Devices

Device	Retains
IC-RP:	Hydrophobic Components
IC-OH:	Anions (pH increase)
IC-H:	Cations (pH reduction)
IC-Ag:	Chloride, Iodide, Bromide
IC-Ba:	Sulfate
IC-Na:	Cations (no pH change)
IC-Chelate:	Polyvalent Metal Ions
IC-Mixed Mode RP-OH:	Hydrophobic Components and Anions (pH increase)
IC-Mixed Mode RP-H:	Hydrophobic Components and Cations (pH reduction)

IC-RP Devices

Description	Volume	Qty	Part No.
Maxi-Clean™ IC-RP	0.5mL	50	5122571
Maxi-Clean™ IC-RP	1.5mL	25	5122566
Extract-Clean™ IC-RP	0.5mL	50	5122898

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