



**Prefilled Poly-Prep[®]
Columns for
Ion Exchange
Chromatography
Instruction Manual**

BIO-RAD

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Section 1

Introduction

Prefilled Poly-Prep columns are small polypropylene columns containing ion exchange resins. These columns combine the analytical quality and wide selection of Bio-Rad's ion exchange resins with the convenience of small, disposable columns. Poly-Prep columns are especially useful in sample preparation for HPLC, GC, IC, and AA analysis.

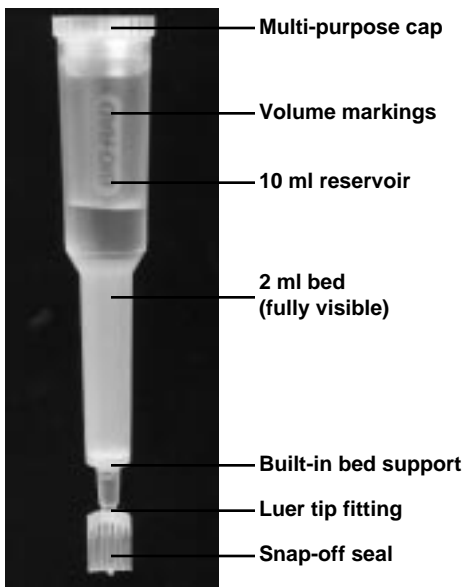


Fig. 1. Poly-Prep column.

Poly-Prep columns are ideal for routine applications in which a small amount of chromatographic medium is used and then discarded, or for multiple sample clean-up applications. They are a time-saving and versatile replacement for Pasteur pipets and other improvised columns.

Section 2 Column Description

The graduate 0.8 x 4 cm columns, constructed of high density polypropylene, hold a standard bed volume of 2 ml of chromatographic media, and include an integral 10 ml reservoir. A Kynar[®] 20 µm frit inside the column acts as a bed support for the resin packing. At the bottom of the column is a snap-off seal, which leaves a male Luer tip fitting when it is removed.

Prefilled Poly-Prep columns are shipped sealed, to prevent the resin packing from drying. Columns are packed in deionized water. During transport, the resin may move to the top of the column. This is corrected by shaking the column and allowing the resin to settle before use. The columns should be stored upright, in a dark, cool location.

Section 3 Instructions for Use

1. Shake the column and allow all the resin to settle to the bottom.

2. Remove the column cap to allow the eluant to flow freely.
3. Snap off the seal at the bottom of the column.
4. Monitor the level of liquid in the reservoir, and do not allow the resin to become dry.
5. Rinse the resin with several bed volumes (at least 2 ml) of the sample solvent. Discard rinse.
6. Add sample.
7. Collect effluent.
8. To reduce the flow rate or stop the flow, use a Luer 3-way stopcock or the yellow end-cap.

Section 4

Ion Exchange Capacity

The resin packing determines the ion exchange capacity of each prefilled Poly-Prep column. Table 1 lists the ion exchange capacity of the resin in each prefilled Poly-Prep column.

Table 1. Ion Exchange Capacity of Prefilled Poly-Prep Columns

Resin	Ion Exchange Capacity (nominal meq/2 ml of rein)
AG [®] 1-X8 resin	2.4
AG 2-X8 resin	2.4
AG 50W-X4 resin	2.2
AG 50W-X8 resin	3.4
Chelex [®] 100 resin	0.8
Bio-Rex [®] 70 resin	4.8

The ion exchange capacity, usually expressed as meq/ml of resin, is equivalent to the number of ion exchange sites per unit volume of resin. The following examples shows the calculated volume of 1 N sodium hydroxide that would be required to convert the 2 ml of resin in a prefilled AG 50W-X8 (H+) Poly-Prep column from the hydrogen form to the sodium form. In general, it is recommended to use only 70-80% of the theoretical capacity of an ion exchange resin.

1 N = 1 equivalent/liter = 1 milliequivalent/milliliter (1 meq/ml)

AG 50W-X8 ion exchange capacity = 1.7 meq

1.7 meq/X ml = 1 N

1.7 meq/1 N = X ml

X = 1.7 ml

Therefore, 1.7 mls of 1 N NaOH required to convert the AG 50W-X8 resin to the sodium form.

Section 5 Flow Rate Characteristics

The flow rate of an ion exchange resin is primarily determined by the particle size of the resin. Using gravity flow, the expected flow rate for 100-200 mesh resin in prefilled Poly-Prep columns is approximately 4-6 ml/minute. The flow rate for 200-400 mesh resin is approximately 1.5 ml/minute.

Bio-Rex 70 resin has slower flow rate than AG or Chelex resins. Bio-Rex 70 100-200 mesh resin flows at approximately 1.0 ml/minute.

Section 6

Chemical Compatibility

Table 2 gives the chemical compatibility of prefilled Poly-Prep columns. While the column is often very resistant, the compatibility of the resin must be considered.

Table 2. Chemical Compatibility of Column

Chemical	Compatibility*
Acetic acid, 50%	S
Acetone	S
Acetonitrile	S
Ammonium hydroxide	S
Chloroacetic acid	S
Chromic acid, 50%	U
Diethyl ether	L
Dimethyl formamide	S
Dimethylsulfoxide	S
Ethyl alcohol	S
Ethylene glycol	S
Formamide	S
Glacial acetic acid	S
Glycerine	S
Hydrochloric acid, 35%	S
Isobutyl alcohol	S
Isopropyl alcohol	S
Methanol	S
Perchloric acid	U
Phosphoric acid	S
Propylene glycol	S
Sodium hydroxide, 50% to Sat.	L (U for anions)
Sulfuric acid, 60%	S (U for anions)
Sulfuric acid, 98%	U
Urea, 8 M	S

* S = Satisfactory U = Unsatisfactory L = Low

Section 7 Temperature Limits

Increases in temperature tend to decrease resin selectivity, and can be used to decrease elution times. Increased temperature also increases exchange kinetics, resulting in sharper resolution. However, some temperature limits must be observed with ion exchange resins. Table 3 gives the maximum temperature for each resin packing.

Table 3. Temperature Limits

Resin Packing	Maximum Temperature (°C)
AG 50 resin	150
AG 1 resin	150 (50 °C if converted to OH ⁻ form)
AG 2 resin	150° (30 °C if converted to OH ⁻ form)
Chelex 100 resin	75
Bio-Rex 70 resin	100

Section 8 Troubleshooting

1. Variation in color (lot-to-lot): Sometimes the color of the resin may vary from lot to lot. This will not affect the ion exchange capacity of the resin.
2. Unusual odor: Amines will sometimes cleave from anion exchange resin after prolonged storage. This is not unusual. They

can be removed easily by rinsing with 2-3 bed volumes of mobile phase.

3. Effluent is red: After prolonged storage, sulfonic acid will sometimes leach from AG 50 strong cation exchange resin, yielding a red effluent. Wash the resin with mobile phase or water until the color is no longer visible.
4. Cloudy effluent: The initial rinse may contain a small quantity of resin. Discard the wash and continue as normal.
5. Flow rate too fast: Use a stopcock to adjust the flow rate.
6. Column runs dry: If the resin is allowed to become dry, air bubbles can form in the column bed. This will affect the flow and the separation efficiency. To correct this, add extra mobile phase, stop-up both ends of the column, shake the column, and allow the resin to settle. Proceed as normal.

If you have any questions about using pre-filled Poly-Prep columns, call our toll-free technical services number, 1-800-424-6723 (in the U.S.), or contact your local Bio-Rad representative.

Section 9

Ordering Information

Catalog Number	Column Packing	Ionic Form	Mesh Size
731-6211	AG 1-X8 Resin, 50	Cl ⁻	100-200
731-6212	AG 1-X8 Resin, 50	Cl ⁻	200-400
731-6221	AG 1-X8 Resin, 50	HCOO ⁻	200-400
731-6247	AG 2-X8 Resin, 50	Cl ⁻	100-200
731-6225	AG 50W-X4 Resin, 50	H ⁺	200-400
731-6213	AG 50W-X8 Resin, 50	H ⁺	100-200
731-6214	AG 50W-X8 Resin, 50	H ⁺	200-400
731-6217	Chelex 100 Resin, 50	Na ⁺	100-200
731-6232	Chelex 100 Resin, 50	Na ⁺	200-400
731-6228	Bio-Rex 70 Resin, 50	Na ⁺	100-200

Note: Special order prefilled Poly-Prep columns are available with the chromatographic material of your choice. A minimum order of 1,000 columns is required for special order. Prices quoted on requested.

Accessories

Catalog Number	Product Description
731-7005	Poly-Prep Column Rack
731-1550	Poly-Prep Columns, empty, 50
<i>Luer-Lock Stopcocks</i>	
732-8102	Luer-Lock 2-Way Stopcock
732-8103	Luer-Lock 3-Way Stopcock
732-8107	Solvent Resistant 3-Way Stopcock

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