IexCap Smac SP 40

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1. Product Description

Smac SP 40 is strong cation exchange resin for the high-throughput intermediate purification and polishing steps of a wide range of biomolecules. The high binding capacity and small particle size of the resin make it a reliable and ideal choice for industrial purification.

Key benefits of **Smac SP 40** include:

- Flexible process design due to large operational window of flow rates and bed heights.
- High-throughput purifications easy to optimize and scale up.
- Higher manufacturing productivity enables improved process economy.
- Security of supply and comprehensive regulatory support.

Smac SP 40 is a strong cation exchange resin. The ion exchange group is a sulphopropyll group, see below.

$-O-CH_2CH_2CH_2SO_3^-$

IexCap Smac SP 40 is a prepacked ready to use column for purification. **IexCap Smac SP 40** 1ml and 5ml columns are packed with 1ml and 5ml of **Smac SP 40**. **IexCap Smac SP 40** can be operated with a peristaltic pump or liquid chromatography systems, such as ÄKTA. It is fast, simple and easy operation.

Table 1. Characteristics of **Smac SP 40**

Item	Description
Matrix	Highly cross-linked agarose
Ion exchange type	Strong cation
Ion exchange capacity	0.13-0.17 mmol H^+/ml medium
Particle Size	30-60 μm
Binding capacity	> 70 mg lysozyme/mL medium
Flow rate	< 200cm/h
pH stability	4-13
Storage buffer	20% ethanol，0.2 M sodium acetate
Storage	4-30℃
Chemical stability	1 M NaOH, 8 M urea, 6 M guanidine hydrochloride, 30% isopropanol and 70% ethanol

2. Purification Procedure

2.1 Buffer Preparation

Water and chemicals used for buffer preparation should be high purity. It is recommended to filter the buffers by passing them through a 0.22 μm or 0.45 μm filter before use.

2.2 Sample Preparation

It is recommended to filter the sample solution by passing them through a 0.22 μm or 0.45 μm filter before use.

2.3 Sample Purification

1) Fill the pump tubing with binding buffer. Connect the column to purification system, “drop to drop” to avoid introducing air into the column.

2) Wash the column with 10 column volumes of binding buffer.

3) Apply the sample, using a syringe fitted to the connector or by pumping it onto the column.

4) Wash with 5 to 10 column volumes of binding buffer or until no material appears in the effluent.

5) Elute with Elution Buffer using a stepwise or linear gradient. For one-step elution, 5 column volumes are usually enough. Other volumes may be required if the interaction is difficult to break. Linear gradient elution can be used to separate proteins of different binding strengths with a small gradient, such as 20 column volumes or more.

2.4 Analysis

Identify the fractions containing the target protein. using UV absorbance, SDS-PAGE, or western blot.

3. Clean-in-Place

After each separation, elute any reversibly bound material either with a high ionic strength solution (e.g. 1M NaCl in buffer) or by increasing pH. Regenerate the media by washing with at least 5 bed volumes of buffer, or until the column effluent shows stable conductivity and pH values.

Cleaning-in-place (CIP) is a cleaning procedure that removes contaminants such as lipids, precipitates, or denatured proteins that may remain in the packed column after regeneration. Regular CIP also prevents the build-up of these contaminants in the media bed and helps to maintain the capacity, flow properties and general performance of the media.

A specific CIP protocol should be designed for each process according to the type of contaminants present. CIP cycle is generally recommended every 1-5 separation cycles.

Remove the ionically bound proteins

Wash with 3-4 column volumes of 2 M NaCl. Contact time 10-15min.

Remove the precipitation or hydrophobically bound proteins or lipoproteins

Wash with at least 2 column volumes of 1 M NaOH . Contact time 1-2 h.

Remove lipids and very hydrophobic proteins

Wash with 3-4 column volumes of 1% non-ionic detergent or 70% ethanol . Contact time 1-2 h.

4. Troubleshooting

Problem	Probable Cause	Solution
Back pressure is too high	Column is clogged	Cleaning in place (part 3).
	Sample solution contains precipitate	Filtering the sample solution by passing them through a 0.22 μm or 0.45 μm filter.
Eluate is not pure	The medium repeat too much times.	Cleaning in place (part 3).
	Wash is not enough.	Increase the volume of Wash Buffer.

5. Related Products

Product	Cat. No.	Size
Smac SP 40	SI028025	25 ml
	SI028100	100 ml
	SI028500	500 ml
	SI02801L	1 L
	SI02810L	10 L
lexCap Smac SP 40	SI028C11	1×1 ml
	SI028C51	5×1 ml
	SI028C15	1×5 ml
	SI028C55	5×5 ml