

Pall® Biosepra® SPEC 70 SLS synthetic ion exchange sorbent for dairy protein separations

Features

Synthetic polymeric sorbent for process chromatography of proteins

- Highly hydrophilic and resistant to micro-organisms
- Macroporous polymer allowing large mass transfers
- Proven biocompatibility, designed to avoid non-specific adsorptions
- Many references for Lactoferrin (LF) and Lactoperoxidase (LD) production at industrial scale.

Introduction

Pall Biosepra SPEC 70 SLS ion exchanger sorbent is a spherical semi-rigid microbead of an acrylic copolymer designed for the ion exchange chromatography of proteins. The beads generate low back pressure at typical low pressure liquid chromatography process flow rates. The strongly bound ion exchange groups, which are an integral part of the polymer structure, constitute a three dimensional structure. Each sub-unit of the polymer possesses hydrophilic groups, which ensure biocompatibility and prevent non-specific adsorption.

SPEC 70 SLS ion exchangers are macroporous, the ion exchange groups are easily accessible, and the sorbent provides high capacity for proteins. Industrial applications currently at production scale includes purification. SPEC 70 SLS has been widely used for the production of LP/LF from milk or sweet whey at 1,500 – 2,000 L scale for more than 20 years and is approved by the FDA for the use with a Food Contact Substance (Food Contact Notification (FCN) number : 000325).

Description

SPEC 70 SLS is an acrylic copolymer bead with a diameter between 260 and 600µm. The polymer is very macroporous and allows a large surface contact and efficient mass transfer. The macromolecules diffuse easily from the outside to inside of the beads.

The active chemical group is sulfopropyl that is ionized upon the pH or ionic strength conditions and adsorbs molecules electrically charged with the opposite signs.

Properties

Particle size (µm)	260 - 600
Exclusion limit (dt) ⁽¹⁾	10 ⁷
Nature of ionizable groups	Sulfopropyl
Amount of ionic groups (µEq/mL)	400 - 700
Binding capacity	
- Lactoperoxidase ⁽²⁾	≥ 40 mg/mL
- Lactoferrin ⁽³⁾	≥ 20 mg/mL
Working pH	4 - 13
Cleaning pH	1 - 14
Chemical stability (detergent)	Excellent
Microbial stability	Excellent
CAS number	388567-01-9
FCN number	000325

⁽¹⁾ For globular proteins

⁽²⁾ Determined using 5 mg/mL lactoperoxidase solution in 0.05 M sodium acetate, pH 5.5 ; elution with 10% NaCl ; column 16mm ID x 200mm

⁽³⁾ Determined using 2.5 mg/mL lactoferrin solution in 0.05 M sodium acetate, pH 5.5 ; elution with 10% NaCl ; column 16mm ID x 200mm

SPEC 70 SLS was previously designed to be used in fluidized/batch mode but it can be used in packed bed mode. The sample (milk or sweet whey) is injected through the previously equilibrated chromatography sorbent. Proteins with an isoelectric point lower than the equilibration buffer pH come out of the column in the effluent while the others are adsorbed. The elution of adsorbed molecules is performed by a sodium chloride gradient. Proteins are separately desorbed and collected.

SPEC 70 SLS can be used as a capture step to bind the Lactoferrin and Lactoperoxidase that will be eluted together or as a separation step, LF and LP are eluted by steps of different salt concentration.

The sorbent is then regenerated with a high salt concentration solution (1 - 2 M sodium chloride) and, if necessary, washed with a cleaning solution such as NaOH. On a large scale, the design of the sorbent allows flux of 25,000 to 50,000 L/h of sweet whey with a residence time in the column from 2 to 8 minutes which allows to protect the biological activities of the proteins.

Chemical stability

SPEC 70 SLS sorbent is not modified by the commonly used solvents and NaOH.

Microbial stability

SPEC 70 SLS sorbent is resistant to microbial degradation.

Thermal stability and storage

Temperature of use	2 - 30°C (36 - 86°F)
Shipping temperature	2 - 30°C (36 - 86°F)
Storage temperature	2 - 30°C (36 - 86°F) 2 - 8°C (36 - 46°F) once opened
Recommended storage solution	Neutral buffer containing 0.5M NaCl and 20% (v/v) ethanol

Ordering information

This is a guide to the Part Numbering structure only. For availability of specific options, please contact Pall.

Size	Part Number
1 Liter	26116-038
10 Liters	26116-020
50 Liters	26116-012



Pall Corporation

Pall Food and Beverage

Portsmouth - **UK**
+44 (0)23 9230 2269 telephone
+44 (0)23 9230 2509 fax
processuk@pall.com

New York - **USA**
866 905 7255 toll free
+1 516 484 3600 telephone
+1 516 625 3610 fax
foodandbeverage@pall.com

Visit us on the web at www.pall.com/foodandbev

Pall Corporation has offices and plants throughout the world in locations including: Argentina, Australia, Austria, Belgium, Brazil, Canada, China, France, Germany, India, Indonesia, Ireland, Italy, Japan, Korea, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Poland, Puerto Rico, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, United States, and Venezuela. Distributors are located in all major industrial areas of the world.

Because of developments in technology these data or procedures may be subject to change. Consequently we advise users to review their continuing validity annually. Part numbers quoted above are protected by the Copyright of Pall Europe Limited.

PALL, Pall and Biosepra are trademarks of Pall Corporation.
Filtration. Separation. Solution is a service mark of Pall Corporation.
© indicates a trademark registered in the USA.
©2006, Pall Corporation.