

Product Data Sheet

Product Name: Cellulose DE-52

Cat. No.: GC26425

Chemical Properties

Cas. No. 9013-34-7

Formula $C_{20}H_{23}NO_5$

M.Wt N/A

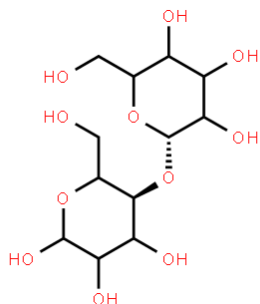
Solubility

Storage Store at 2-8°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Methods and Precautions for Using Cellulose DE-52:

1. Column Packing

(1) Material preparation: All materials should be equilibrated to the operating temperature. Buffer solutions should preferably be degassed in advance. Weigh the required amount of medium, swell it in buffer for 1h, and then pack the column. If swelling is insufficient, moderate heating may be applied to facilitate the process.

(2) Bottom venting: Add 20% ethanol to the column bottom to expel trapped air, close the outlet, and retain a small liquid seal. If using 20% ethanol, 1% Tween may be added to prevent bubble formation. Alternatively, distilled water can be used for packing, but the 20% ethanol in the medium must first be exchanged with water. This can be achieved by suction filtration on a Büchner funnel, or

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Product Data Sheet

by carefully decanting the ethanol supernatant and resuspending the medium in 5 volumes of distilled water, repeating the settling and decanting process approximately 5 times until the medium is ready for packing.

(3) Packing procedure: Due to the fine particle size of this medium, a suitable mesh size must be selected for the screen to prevent leakage (it is advisable to test a small amount of medium on the screen beforehand). When continuously pouring the medium into the column, use a glass rod against the inner wall to guide the slurry flow, minimizing bubble entrapment. Allow the medium to settle by gravity until the bed volume stabilizes and the supernatant becomes clear with a distinct interface. Then, start the pump and apply an appropriate flow rate to compress the bed. Once the bed volume is stable, adjust the adapter to firmly contact the bed surface and equilibrate the column with buffer. The operating flow rate should be lower than the packing flow rate.

(4) Temperature equilibration: The medium should be removed from refrigeration and allowed to stand at room temperature for at least 2-3h before packing, to prevent bubble formation within the column due to temperature differences.

2. Protein Binding

The salt concentration and pH of the sample should be as consistent as possible with those of the equilibration buffer. Excessive salt concentration or low pH may result in binding failure; therefore, adjustments should be made according to the specific properties of the sample.

3. Protein Elution

(1) Linear gradient elution: A column diameter-to-height ratio greater than 10 is recommended; a higher ratio improves resolution. Sample loading should not be excessive; approximately 10mg/mL of medium is suggested.

(2) Stepwise elution: Suitable for short, wide columns, with no limitation on loading amount. This method is easy to scale up and offers good reproducibility. With optimized elution conditions, the separation performance can be comparable to or even better than that of linear gradient elution. The choice of method should be based on experimental requirements.

4. Regeneration and Cleaning

(1) After use, wash sequentially with 0.1M acetic acid for 5 column volumes, followed by 2M NaCl for 5 column volumes, then rinse with distilled water until neutral, and finally store in 20% ethanol.

(2) Mixing organic solvents with water can readily generate bubbles. To avoid this, it is recommended to prepare the mixture and let it stand overnight at room temperature before use, preventing bubbles

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from entering the column and compromising performance.

Special Precautions:

- (1) Before loading, the sample must be filtered through a 0.45µm membrane, and pigments should be removed as much as possible, as they can adsorb onto the medium and impair its performance.
- (2) Strong acids and strong bases are strictly prohibited; the concentration of acids or bases used should not exceed 0.15M.

Background

Cellulose DE-52 is a weak anion exchanger based on a highly cross-linked cellulose matrix, with a particle size of approximately 50µm^[1]. The surface of Cellulose DE-52 is grafted with macromolecular sugar chains, which endows it with a higher specific surface area and improved biocompatibility, allowing it to maintain a high binding capacity even at high flow rates. Cellulose DE-52 is typically used for the chromatographic purification of biomacromolecules that require high resolution and capacity, such as plasmid DNA, viral particles, and proteins^[2,3,4].

Features of Cellulose DE-52 :

Characteristics	Good biocompatibility, high capacity, high resolution
Appearance	White or off-white fibrous lumps
Matrix	Highly cross-linked cellulose
Ligand	Diethylaminoethyl
Ligand density	40µmol/mL
Binding capacity	110mg HSA/mL
Particle size	50µm
Maximum flow rate	100cm/h
pH range	pH 3-10; pH 2-11 during cleaning-in-place
Chemical stability	Stable in various buffers and salts, acetic acid, etc.
Physical stability	0.1M neutral buffer, 120°C 30min

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Storage temperature	4°C
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Reference:

- [1] Wilson R J H, Kay G, Lilly M D. The preparation and kinetics of lactate dehydrogenase attached to water-insoluble particles and sheets[J]. Biochemical Journal, 1968, 108(5): 845-853.
- [2] Efremov G D, Huisman T H J. Studies on the heterogeneity of hemoglobin: XV. Separation of fetal hemoglobin and the normally occurring minor adult hemoglobins by chromatography on DEAE-cellulose[J]. Journal of Chromatography A, 1974, 89(2): 191-196.
- [3] Millard F, Fox B W. Fractionation of mammalian DNA on DEAE-cellulose[J]. Journal of Chromatography A, 1975, 107(1): 125-140.
- [4] Lewis B J, Abrell J W, Smith R G, et al. DNA polymerases in human lymphoblastoid cells infected with simian sarcoma virus[J]. Biochimica et Biophysica Acta (BBA)-Nucleic Acids and Protein Synthesis, 1974, 349(2): 148-160.

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