

RESEARCH PAPERS

球形纤维素-钛白粉复合基质的扩张床流体混合特性

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摘要 Expanded bed adsorption (EBA) has been widely used in industrial downstream bioprocessing. Solid matrix is the principal pillar supporting the successful application of EBA. A novel spherical cellulose-titanium dioxide composite matrix was prepared through the method of water-in-oil suspension thermal regeneration. Its typical physical properties were wet density 1.18g.cm⁻³, diameters in the range of 100-300μm, porosity 85.5%, and water content 72.3%. Expansion characteristics and liquid mixing performance of the matrix in expanded bed were investigated using water and 10% (by mass) glycerol solution as mobile phases. The results indicate that the custom-assembled matrix has a stable flow hydrodynamics and exhibits the same degree of liquid-phase mixing or column efficiency as the commercially available Streamline adsorbent.

关键词 [expanded bed adsorption](#) [matrix](#) [cellulose](#) [titanium dioxide](#)

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Physical and Hydrodynamic Properties of Spherical Cellulose-Titanium Dioxide Composite Matrix for Expanded Bed Adsorption

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Abstract Expanded bed adsorption (EBA) has been widely used in industrial downstream bioprocessing. Solid matrix is the principal pillar supporting the successful application of EBA. A novel spherical cellulose-titanium dioxide composite matrix was prepared through the method of water-in-oil suspension thermal regeneration. Its typical physical properties were wet density 1.18g.cm⁻³, diameters in the range of 100-300μm, porosity 85.5%, and water content 72.3%. Expansion characteristics and liquid mixing performance of the matrix in expanded bed were investigated using water and 10% (by mass) glycerol solution as mobile phases. The results indicate that the custom-assembled matrix has a stable flow hydrodynamics and exhibits the same degree of liquid-phase mixing or column efficiency as the commercially available Streamline adsorbent.

Key words [expanded bed adsorption](#); [matrix](#); [cellulose](#); [titanium dioxide](#)

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