

عنوان مقاله:

Fabrication and Evaluation of Agarose-Zinc Composite Particles for Expanded Bed Applications

محل انتشار:

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خلاصه مقاله:

Agarose-Zinc composite particles as matrix for expanded bed adsorption (EBA) were exploited through the method of water-in-oil emulsification. The structure and morphology of the prepared matrix were studied by the optical microscope (OM). The physical properties of the prepared matrix were diameters in the range of 65–275 μm and wet density of 1.6 g/ml. For the Agarose-Zinc matrix and Streamline DEAE, bed expansion as the function of fluid velocity was measured and correlated by Richardson–Zaki equation. Furthermore, the correlation parameters (U_t and n) were determined. The suitable expansion factor was considered less than 2.67, while the corresponding fluid velocity was about 751.8 cm/h for Agarose-Zinc matrix and 522.2 for Streamline DEAE. The residence time distributions were investigated to characterize the hydrodynamic properties in expanded bed. Liquid mixing in the bed was measured to evaluate the stability of expanded bed and the results were compared with those obtained with Streamline DEAE. The results indicated that Agarose-Zinc matrix showed better features of expansion, lower axial mixing than the commercial Streamline DEAE matrix. In addition, the axial mixing coefficients (D_{axl}) were between 2.1 and $8.6 \times 10^{-6} \text{ m}^2/\text{s}$, which demonstrated that a stable expanded bed could be formed under suitable operation conditions; and Agarose-Zinc matrix is suitable for EBA

کلمات کلیدی:

Agarose-Zinc matrix, Streamline DEAE, Expanded bed adsorption, Physical properties, Hydrodynamic properties

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