

عنوان مقاله:

Applying Neural Network to Dynamic Modeling of Biosurfactant Production Using Soybean Oil Refinery Wastes

محل انتشار:

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خلاصه مقاله:

Biosurfactants are surface active compounds produced by various microorganisms. Production of biosurfactants via fermentation of immiscible wastes has the dual benefit of creating economic opportunities for manufacturers, while improving environmental health. A predictor system, recommended in such processes, must be scaled-up. Hence, four neural networks were developed for the dynamic modeling of the biosurfactant production kinetics, in presence of soybean oil or refinery wastes including acid oil, deodorizer distillate and soap stock. Each proposed feed forward neural network consists of three layers which are not fully connected. The input and output data for the training and validation of the neural network models were gathered from batch fermentation experiments. The proposed neural network models were evaluated by three statistical criteria (R^2 , RMSE and SE). The typical regression analysis showed high correlation coefficients greater than 0.971, demonstrating that the neural network is an excellent estimator for prediction of biosurfactant production kinetic data in a two phase liquid-liquid batch fermentation system. In addition, sensitivity analysis indicates that residual oil has the significant effect (i.e. 49%) on the biosurfactant in the process

کلمات کلیدی:

Batch fermentation Biosurfactant Dynamic modeling Neural network

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