



Recovery of *Bacillus thuringiensis* based biopesticides from fermented sludge by cross-flow microfiltration

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ABSTRACT

The recovery of *Bacillus thuringiensis* (Bt) based biopesticides from fermented sludge broth via cross-flow microfiltration (CFMF) was evaluated. Three types of microfiltration membranes, WX-model cellulose, cellulose acetate, and polyethersulfone, were tested for their permeate flux and restoration capacity. The cellulose acetate membrane with a pore size of 0.8 µm was selected for further process optimization and modeling of CFMF. Under optimal conditions, the permeate flux could be greater than 201/m²/h if the retentate contained was less than 100 g/l. The spore and crystal proteins recoveries were found to be 99 and 95%, respectively. The standard hydraulic resistance-in-series model was used to determine the parameters of CFMF of Bt fermented sludge. The results demonstrated that CFMF was effective for Bt based biopesticide recovery from fermented sludge.

Keywords: *Bacillus thuringiensis*; Permeate flux; Process optimization; Membrane; Modeling

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