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Equilibrium studies for the adsorption of fructo-oligosaccharides from a pure mixture and a fermentative broth on a Dowex Monosphere calcium resin

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ABSTRACT

Fructo-oligosaccharides (FOS) namely, kestose, nystose and fructofuranosyl-nystose, are prebiotics that can be obtained by fermentation. The resulting fermentative broth is a complex mixture consisting also of salts and other sugars that must be removed. Adsorption equilibrium studies were conducted using the static method in batch mode onto Dowex Monosphere calcium resin, at 60°C, for FOS contained in a fermentative broth and pure mixtures. Experimental isotherms data were analyzed using *linear*, *Langmuir/anti-Langmuir*, *Freundlich*, *Redlich & Peterson*, and *Toth* models. Isotherm parameters were determined using linear and nonlinear correlations for the minimization of several error functions. The nonlinear correlations were found to provide the best isotherm parameters for the models. FOS contained in a fermentative broth were well fitted with *anti-Langmuir* isotherms, while FOS in pure mixtures were better fitted with *Toth*, *Langmuir* and *Redlich & Peterson* isotherms. A detailed error analysis was carried out to investigate the effect of using different error criteria for the determination of the isotherm parameters.