

Purification of fructo-oligosaccharides by adsorption onto charcoal filters

C. Nobre¹, A. Dominguez¹, D. Torres^{1,2}, O. Rocha¹, L. Rodrigues^{1,2}, I. Rocha^{1,2}, J.A. Teixeira¹, E.C. Ferreira¹

¹Instituto de Biotecnologia e Bioengenharia, Centro de Engenharia Biológica da Universidade do Minho, Campus de Gualtar, 4710-057 Braga, Portugal.

²Biotempo – Consultoria em Biotecnologia, Lda., Praça Camilo Castelo Branco nº6, 4700-209 Braga, Portugal

E-mail: clarissenobre@deb.uminho.pt

Production of fructo-oligosaccharides has received particular attention recently due to its beneficial effects as prebiotics. Fermentative processes appear to be a good technique for large scale production of FOS. However, the result of such fermentations is a complex mixture containing salts and low molecular weight sugars that do not contribute to the beneficial properties of the higher molecular weight oligosaccharides, and so have to be eliminated. Among the several strategies being studied to solve this problem, the adsorption onto activated carbon is a promising technique that still requires further development. Thus, the aim of this work was the purification of FOS from a fermentation broth using charcoal filters. Microfiltration membranes (0,20 micrometers) were successfully used to separate the biomass; nevertheless salts and other small sugars had to be eliminated using a charcoal filter. Hence, 200 mL of fermentative broth (without cells) was passed through the filter. Subsequently, the filter was washed with water removing the salts and small sugars present in the mixture. The oligosaccharides adsorbed onto the charcoal filter were recovered using a 44% ethanol solution. An increased purity, from 30% to 97% (w/w) in total sugars, was achieved using this downstream process, as compared to the initial mixture. The results gathered in this work suggest that charcoal filters are a promising technology for the purification of FOS from fermentation mixtures at an industrial scale, making clear the need for further work in order to optimize this process.