

Title: Assessment of saccharide fractionation by ultrafiltration and nanofiltration

Author(s): Catarino, Isabel ^[1]; **Minhalma, Miguel** ^[1,4]; Beal, Lademir L. ^[3]; Mateus, Marília ^[2]; Pinho, Maria Norberta de ^[1]

Source: Journal of Membrane Science **Volume:** 312 **Issue:** 1-2

Pages: 34-40 **DOI:** 10.1016/j.memsci.2007.12.057 **Published:** Apr 1 2008

Document Type: Article

Language: English

Abstract: This paper addresses the investigation of the fractionation of saccharide mixtures and saccharide mixtures with calcium using ultrafiltration (UF) and nanofiltration (NF). A set of cellulose acetate membranes covered a wide range of molecular weight cut-off (MWCO) ranging from 250 to 46,000 Da and the total feed concentration of saccharides mixtures varied from 1550 to 4700 ppm with the ratio of the two saccharides-solutes (glucose to raffinose) being kept constant at the value of 1.8. The evolution pattern of the saccharide concentration ratio in the UF/NF permeate streams displayed a dependence on the membrane MWCO, on the total sugar concentration and on the presence of calcium ions. For the highest total sugar content, the membranes with MWCO from 2000 to 7000 Da showed saccharide fractionation capability that was enhanced in the presence of calcium. The Steric Pore Flow Model was used to predict individual solute permeation behaviours and to assess the deviations to steric hindered transport of the solutes in multi-component saccharide solutions. (C) 2008 Elsevier B.V. All rights reserved.

Author Keywords: Nanofiltration; Ultrafiltration; Saccharides fractionation; Annealing

KeywordsPlus: Cellulose-Acetate Membranes; Reverse-Osmosis Separation; Oligosaccharides; Purification; Ethanol; Sugar

Reprint Address: de Pinho, MN (reprint author) - Inst Super Tecn, Dept Chem & Biol Engn, Av Rovisco Pais 1, P-1049001 Lisbon, Portugal.

Addresses:

[1] Inst Super Tecn, Dept Chem & Biol Engn, P-1049001 Lisbon, Portugal

[2] Inst Super Tecn, Ctr Biol & Chem Engn, IBB, P-1049001 Lisbon, Portugal

[3] Univ Caxias do Sul, Inst Saneamento Ambiental, BR-95070560 Caxias Do Sul, Brazil

[4] Inst Super Engn Lisboa, Dept Chem Engn, P-1959007 Lisbon, Portugal

E-mail Addresses: marianpinho@ist.utl.pt

Publisher: Elsevier Science BV

Publisher Address: Po Box 211, 1000 AE Amsterdam, Netherlands

ISSN: 0376-7388

Citation: CATARINO, Isabel; MINHALMA, Miguel; BEAL, Lademir L.; MATEUS, Marília; PINHO, Maria Norberta de - Assessment of saccharide fractionation by ultrafiltration and nanofiltration. Journal of Membrane Science. ISSN 0376-7388. Vol. 312, nr 1-2 (2008), p. 34-40.