

Flux flow and cleaning enhancement in a spiral membrane element, using continuous infrasonic backpulsing[#]

DS McLachlan*, D Koen and RD Sanderson

UNESCO Associated Centre for Macromolecules and Materials, Department of Chemistry and Polymer Science, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa

Abstract

The effect of backpulsing, into the permeate space of a 2.5 inch spiral wrap membrane, on the prevention of fouling (flux enhancement) was investigated experimentally. These experiments were performed using a 500 mg·ℓ⁻¹ dextrin solution and a 100 000 MCWO polypropylene membrane, with a feed pressure of 100 kPa and a cross-flow rate of 1 000 ℓ·h⁻¹. Experimental results showed that a backpulse with a duration of about 170 ms, a repeat frequency of 1 s and differential peak pulse pressure, measured at the outlet of the permeate space, of 38 kPa gave the best results for the parameters used in the current experiments. In this case the saturation flux with backpulsing was 82% of the clean water value and 3.9 times the saturation flux obtained with no backpulsing.

Keywords: Spiral wrap element, membrane cleaning, infrasonic, back pulsing