A systematic assessment method for the investigation of the PVDF membrane stability

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Received 5 October 2014; Accepted 16 November 2014

ABSTRACT
This article reports the systematic assessment method for membrane stability using a hydrophilic polyvinylidene fluoride (PVDF) membrane. In this study, bovine serum albumin, fouled PVDF flat-sheet membranes were cleaned with sodium hydroxide (NaOH) and sodium hypochlorite (NaOCl). The effects of repeated chemical cleaning on membrane water flux recovery and the PVDF membrane intrinsic properties were investigated. The virgin and cleaned membranes were characterised by water flux measurement, field emission scanning electron microscopy, tensile test, Fourier transform infrared, contact angle measurement and protein rejection performance. As expected, higher cleaning efficiency was achieved when using higher concentration and extended cleaning time with NaOCl showing better performance compared to NaOH. It was found that the use of chemical cleaning agent for fouling control has an impact on membrane integrity and shortens their lifespan. Their declining functionality is normally associated with ageing; a term meant to describe changes in physical parameters and a declined stability.

Keywords: PVDF membrane; Stability; NaOH; NaOCl; Degradation

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Presented at the International Conference on Business, Economics, Energy and Environmental Sciences (ICBEEES) 19–21 September 2014, Kuala Lumpur, Malaysia

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