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Polyvinyl Chloride (PVC) Ultrafiltration Membrane Fouling and Defouling Behavior: EDLVO Theory and Interface Adhesion Force Analysis

Wanyi Fu[a,1], Lan Wang[b1], Fangjuan Chen[b], Xuezhi Zhang[b*] and Wen Zhang[a*]

[a]John A. Reif, Jr. Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, NJ 07102, USA
[b]Center for Microalgal Biotechnology and Biofuels, Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan 430061, China

Wen Zhang (wzhang81@njit.edu)
Xuezhi Zhang (zhangxuezhi@ihb.ac.cn)
* Corresponding authors.

Abstract

To unravel fouling and defouling mechanisms of protein, saccharides and natural organic matters (NOM) on polymeric membrane during filtration, this study investigated filtration characteristics on polyvinyl chloride (PVC) ultrafiltration membranes with bovine serum albumin, dextran, humic acid as model foulants. Membrane fouling and defouling performances were analyzed through monitoring the flux decline during filtration and flux recovery during physical backwash. Physico-chemical properties (e.g., hydrophobicity and surface charge) of PVC membrane and foulants were characterized, which were used in the extended Derjaguin–Landau–Verwey–Overbeek (EDLVO) theory to calculate the interaction energies between membrane-foulant and foulant-foulant. The results showed that at the later filtration stages the

[1] The first and second authors contributed equally to this work.