Ultra-thin, multi-layered polyamide membranes: synthesis and characterization

Xiaoxiao Song, Saren Qi, Chuyang. Y. Tang, Congjie Gao

www.elsevier.com/locate/memsci

PII: S0376-7388(17)30554-9
DOI: http://dx.doi.org/10.1016/j.memsci.2017.06.016
Reference: MEMSCI15328

To appear in: *Journal of Membrane Science*

Received date: 22 February 2017
Revised date: 1 June 2017
Accepted date: 6 June 2017

Cite this article as: Xiaoxiao Song, Saren Qi, Chuyang. Y. Tang and Congjie Gao, Ultra-thin, multi-layered polyamide membranes: synthesis and characterization, *Journal of Membrane Science* http://dx.doi.org/10.1016/j.memsci.2017.06.016

Ultra-thin, multi-layered polyamide membranes: synthesis and characterization

Xiaoxiao Song[a,*1], Saren Qi[b1], Chuyang. Y. Tang[b,c*], and Congjie Gao[a]

[a]Center for Membrane and Water Science & Technology, Zhejiang University of Technology, Hangzhou, 310014, China

[b]Singapore Membrane Technology Centre, Nanyang Environment and Water Research Institute, Nanyang Technological University, Singapore 639798.

[c]The University of Hong Kong, Department of Civil Engineering, Pokfulam, Hong Kong.

songxiaoxiao@zjut.edu.cn

tangc@hku.hk

[*]Corresponding authors.

Abstract

Customization of thickness and roughness of thin film composite reverse osmosis (TFC-RO) membranes provides opportunities to optimize the membrane permeability and fouling resistance. We propose a novel strategy to synthesize ultrathin multi-layered polyamide (ML-PA) membranes with the versatile maneuverability of the salt rejecting layer thickness and roughness. We have employed advanced quartz crystal microbalance with dissipation (QCMD) techniques to study the deposition rate of the ultrathin PA nanolayers with a resolution of approximately 8, 15 and 25 nm per deposition cycle. At brackish water desalination condition, the ML-PA membrane exhibited ~60% flux increase and higher salt rejection compared with the home-made

[1] The authors contribute equally