

## Accepted Manuscript

Bioinspired tannic acid-copper complexes as selective coating for nanofiltration membranes

Tina Chakrabarty, Liliana Pérez-Manríquez, Pradeep Neelakanda, Klaus-Viktor Peinemann

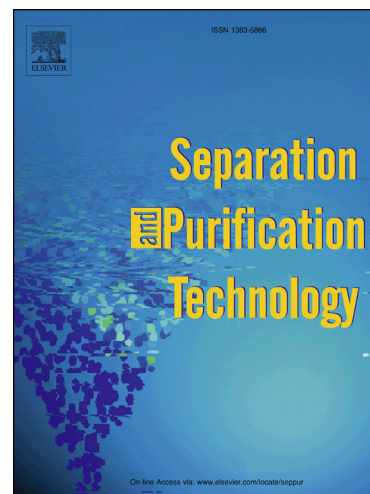
PII: S1383-5866(17)30315-5  
DOI: <http://dx.doi.org/10.1016/j.seppur.2017.04.043>  
Reference: SEPPUR 13705

To appear in: *Separation and Purification Technology*

Received Date: 28 January 2017  
Revised Date: 25 April 2017  
Accepted Date: 25 April 2017

Please cite this article as: T. Chakrabarty, L. Pérez-Manríquez, P. Neelakanda, K-V. Peinemann, Bioinspired tannic acid-copper complexes as selective coating for nanofiltration membranes, *Separation and Purification Technology* (2017), doi: <http://dx.doi.org/10.1016/j.seppur.2017.04.043>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## Bioinspired tannic acid-copper complexes as selective coating for nanofiltration membranes

Tina Chakrabarty, Liliana Pérez-Manríquez, Pradeep Neelakanda, and Klaus-Viktor Peinemann\*

Advanced Membrane and Porous Materials Center, King Abdullah University of Science and Technology (KAUST), 23955-6900, Thuwal, Saudi Arabia

E-mail: [klausviktor.peinemann@kaust.edu.sa](mailto:klausviktor.peinemann@kaust.edu.sa)

### ABSTRACT

Bio-polyphenols that are present in tea, date fruits, chocolate and many other plants have been recognized as scaffold material for the manufacture of composite filtration membranes. These phenolic biomolecules possess abundant gallicol (1,2,3-trihydroxyphenyl) and catechol (1,2-dihydroxyphenyl) functional groups, which allow the spontaneous formation of a thin polymerized layer at the right pH conditions. Here, we report a facile and cost-effective method to coat porous membranes via the complexation of tannic acid (TA) and cupric acetate (mono hydrate) through co-deposition. The modified membranes were investigated by XPS, ATR/FTIR, water contact angle, SEM and water permeance for a structural and morphological analysis. The obtained results reveal that the modified membranes with TA and cupric acetate (CuII) developed a thin skin layer, which showed excellent hydrophilicity with good water permeance. These membranes were tested with different molecular weight polyethylene glycols (PEG) in aqueous solution; the MWCO was around 600 Daltons.

**Keywords:** Polyphenols, tannic acid-copper complex, membrane surface modification, nanofiltration.

Download English Version:

<https://daneshyari.com/en/article/4989747>

Download Persian Version:

<https://daneshyari.com/article/4989747>

[Daneshyari.com](https://daneshyari.com)