

Ultrafiltration based on various polymeric membranes for recovery of spent tungsten slurry for reuse in chemical mechanical polishing process

Nur Fatin Amalina Muhammad Sanusi, Mohd Hizami Mohd Yusoff, Ooi Boon Seng, Mohd Sabirin Marzuki, Ahmad Zuhairi Abdullah



PII: S0376-7388(17)32520-6
DOI: <https://doi.org/10.1016/j.memsci.2017.11.034>
Reference: MEMSCI15730

To appear in: *Journal of Membrane Science*

Received date: 29 August 2017
Revised date: 13 November 2017
Accepted date: 13 November 2017

Cite this article as: Nur Fatin Amalina Muhammad Sanusi, Mohd Hizami Mohd Yusoff, Ooi Boon Seng, Mohd Sabirin Marzuki and Ahmad Zuhairi Abdullah, Ultrafiltration based on various polymeric membranes for recovery of spent tungsten slurry for reuse in chemical mechanical polishing process, *Journal of Membrane Science*, <https://doi.org/10.1016/j.memsci.2017.11.034>

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 galley proof before it is published in its final citable 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.

Ultrafiltration based on various polymeric membranes for recovery of spent tungsten slurry for reuse in chemical mechanical polishing process

Nur Fatin Amalina Muhammad Sanusi¹, Mohd Hizami Mohd Yusoff¹, Ooi Boon Seng¹,
Mohd Sabirin Marzuki², Ahmad Zuhairi Abdullah^{1,*}

¹School of Chemical Engineering, Universiti Sains Malaysia, Engineering Campus,
14300 Nibong Tebal, Penang, Malaysia.

²SilTerra Malaysia Sdn Bhd, Lot 8, Industrial Zone Phase 2, Kulim Hi-Tech Park, 09000
Kulim, Kedah, Malaysia.

Tel: +604-599 6411, Fax: +604-594 1013

Email: chzuhairi@usm.my

Abstract

Membrane separation based on ultrafiltration for the recovery of spent tungsten slurry from chemical mechanical polishing (CMP) process has been investigated. Five polymeric membranes with different molecular weight cut-off (MWCO) i.e. 10kDa PES, 30kDa PES, 100kDa PES, 50kDa PS and 50kDa PVDF were successfully applied. Flux analysis was conducted to study the fouling phenomena and the fouling effects on membrane surface were elucidated by means of SEM and AFM analyses. Almost steady fluxes were reached after about 60 min of filtration process. Meanwhile, the membrane fouling was mainly due to the formation of cake layer on the membrane surface leading to blockage of membrane pores. On top of that, 50kDa PS membrane showed the highest potential in filtrating and concentrating the CMP spent tungsten slurry with 92 % retention of silica particles and 42 % retention of tungsten. Furthermore, it also achieved

Download English Version:

<https://daneshyari.com/en/article/7020279>

Download Persian Version:

<https://daneshyari.com/article/7020279>

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