

Accepted Manuscript

Sequential liquid separation using meshes with hierarchical microcube–nanohole structure and controlled surface wettability

Seoun Woo, Wonshik Kwak, Woonbong Hwang

PII: S0169-4332(18)32238-4

DOI: <https://doi.org/10.1016/j.apsusc.2018.08.102>

Reference: APSUSC 40139

To appear in: *Applied Surface Science*

Received Date: 30 May 2018

Revised Date: 27 July 2018

Accepted Date: 11 August 2018

Please cite this article as: S. Woo, W. Kwak, W. Hwang, Sequential liquid separation using meshes with hierarchical microcube–nanohole structure and controlled surface wettability, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.08.102>

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.



Sequential liquid separation using meshes with hierarchical microcube–nanohole structure and controlled surface wettability

Seeun Woo, Wonshik Kwak, and Woonbong Hwang*

Department of Mechanical Engineering, POSTECH, Pohang 37673, Republic of Korea

ABSTRACT

In actual industrial processes, in addition to separation of just water and oil, separation of multiphase liquids and separation of organic solvents are also required. Here, we demonstrate successful multiphase liquid separation by simply applying different coating materials to aluminum meshes with a hierarchical microcubic and nanohole structure. A gravity-driven multiphase separation system was designed using these meshes as the separation media, and it showed high collection rate (99%) and high content ratio (95%). The fabricated separation system could sequentially separate liquids with surface tension of ≤ 21.6 , $21.6\text{--}32.0$, and ≥ 32.0 mN/m by choosing a filter with the proper surface energy. Given

* Corresponding author. Tel: +82-54-279-2174. Fax: +82-54-279-5899.

E-mail address: whwang@postech.ac.kr (W. Hwang).

Abbreviations: CA, contact angle; DI, deionized; FE-SEM, field-emission scanning electron microscopy; HDFS, heptadecafluoro-1,1,2,2,-tetrahydrodecyl trichlorosilane; OTS, octadecyltrichlorosilane; SA, sliding angle; SAM, self-assembled monolayer; SBSi, sulfobetaine silane; TEOS, tetraethyl orthosilicate; XPS, X-ray photoelectron spectroscopy

Download English Version:

<https://daneshyari.com/en/article/7832767>

Download Persian Version:

<https://daneshyari.com/article/7832767>

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