LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH: JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) : FOULING MECHANISM OF MICELLE ENHANCED ULTRAFILTRATION WITH SDS SURFACTANT FOR INDIGOZOL DYE REMOVAL

Jumlah Penulis : 5 orang

Status Pengusul : Penulis pertama/ ~~penulis ke - 3/ penulis korespondensi~~

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d. Penerbit : Universiti Teknologi Malaysia
e. DOI Artikel : 10.11113/jt.v80.12741
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g. Terindeks : Scopus/Scimagojr/SJR-0,18 (2018) dan Q2

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Total = (100 %)	30	32,9	**31,45**
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Prof. Dr. Ir. Bakti Jos, DEA
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1. Kesesuaian dan kelengkapan unsur isi iurnal:
Unsur artikel meliputi Title, Abstract, Keywords, Introduction, Methodology, Results and Discussion, Conclusion, Acknowledgment dan References. Artikel telah ditulis sesuai dengan petunjuk penulisan dari jurnal Teknologi. Artikel merupakan *selected paper* dari Membrane Science Technology (MST) Conference 2017.

2. Ruang lingkup dan kedalaman pembahasan:
Artikel membahas mengenai mekanisme fouling pada MEUF untuk penghilangan zat warna indigosol dengan surfaktan SDS. Topik yang ditulis telah sesuai dengan bidang riset Teknik Kimia yaitu separasi menggunakan teknologi membrane. Pembahasan terkait grafik dan tabel telah dituliskan cukup detail serta telah didukung oleh referensi, meskipun dari 39 pustaka dalam referensi, hanya terdapat 13 pustaka (33.3%) yang disitasi di bagian pembahasan.

3. Kecukupan dan kemutakhiran data/infrmasi dan metodologi:
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Total = (100%)	**35**			32.9
Nilai pengusul = 60 % x 32.9				**19.74**

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2. Ruang lingkup dan kedalaman pembahasan:
Ruang lingkup artikel sederhana namun cukup menarik yaitu mengkaji perbedaan fenomena filtrasi antara sistem ultrafiltrasi dan sistem micellar-enhanced ultrafiltration membrane system (MEUF Kajian menjadi menarik dan agak komplicated ketika bahan kerja yang dipakai adalah zat pewarna reaktif, pengaruh konsentrasi surfaktan, dan membahas mekanisme bloking dengan parameter-parameternya. Masing-masing dibahas secara komprehensif, dengan merujuk atau membandingkannya dengan peneliti2 terdahulu yang sejenis. Ini dapat dilihat sitasi dalam teks pada sub bab pembahasan sangat banyak yaitu 12 buah dari peneliti pembanding. Secara over-all artikel ini bagus. **(nilai → 29 %)**

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Semarang, 12 Maret 2020
Reviewer II

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Jurnal Teknologi Open Access
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Fouling mechanism of micelle enhanced ultrafiltration with SDS surfactant for indigozol dye removal (Article) (Open Access)

Aryanti, N., Saraswati, A., Putra, R.P., Nafiunisa, A., Wardhani, D.H.

Department of Chemical Engineering, Faculty of Engineering, Diponegoro University, Semarang, 50275, Indonesia

Abstract

Membrane separation technology was proposed to confront the problem of inorganic dye pollutant treatment such as an indigosol dye. A modified ultrafiltration process known as micellar-enhance ultrafiltration (MEUF), was applied to remove three kinds of indigosol dye (Pink IR, Blue O4B, and vat brown). Surfactant at concentration above CMC was added to form micelle structure and solubilize the dye molecule in the feed solution. Maximum dye rejection was achieved by the MEUF of all three kinds of indigosol dye. The rejection of indigosol pink IR, blue O4B, and brown VAT1 were 94,27%, 95,49% and 99,15%, respectively. In this research, it was found that the MEUF system leads to higher membrane flux, compared to the ultrafiltration system as shown in flux profiles. The difference was expected due to different dye molecular structure. Blocking mechanism was predicted by a mathematical model based on Hermia's model and depicted a mechanism of complete blocking on most UF process and cake formation on MEUF process. This result confirmed that the MEUF system certainly retained the dye molecule on membrane separation process. However, a comprehensive study is required to increase the membrane flux. © 2018 Penerbit UTM Press. All rights reserved.

SciVal Topic Prominence

Topic: Ultrafiltration | Surface active agents | Micellar-enhanced ultrafiltration

Prominence percentile: 89.011

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Blocking mechanism | Indigo sol dye | Membrane separation | Micellar-enhance ultrafiltration | Wastewater

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Science and Engineering

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EVALUATION OF BACTERIAL CELLULOSE-SODIUM ALGINATE FORWARD OSMOSIS MEMBRANE FOR WATER RECOVERY

Ngan T. B. Dang, Liza B. Patacsil, Aileen H. Orbecido, Ramon Christian P. Eusebio, Arnel B. Beltran

PDF

PHARMACEUTICAL COMPOUND REMOVAL DURING MIXED LIQUOR FILTRATION IN MEMBRANE BIOREACTOR OPERATED UNDER LONG SLUDGE AGE

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EFFECT OF AGAR-KAOLIN INTERACTION IN GELCASTING MIXTURES ON FORMING OF ALUMINA MEMBRANE SUPPORT

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Full Paper

EVALUATION OF BACTERIAL CELLULOSE-SODIUM ALGINATE FORWARD OSMOSIS MEMBRANE FOR WATER RECOVERY

Ngan T. B. Dang[a], Liza B. Patacsil[b], Aileen H. Orbecido[a], Ramon Christian P. Eusebio[c], Arnel B. Beltran[a*]

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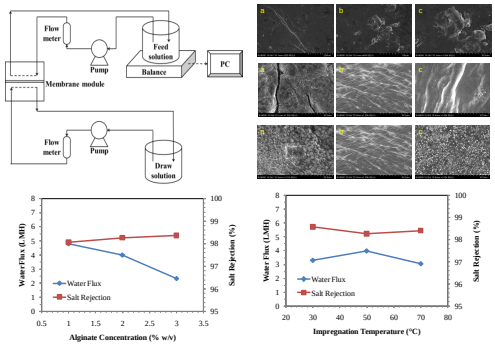
Graphical abstract



Abstract

Water resources are very important to sustain life. However, these resources have been subjected to stress due to population growth, economic and industrial growth, pollution and climate change. With these, the recovery of water from sources such as wastewater, dirty water, floodwater and seawater is a sustainable alternative. The potential of recovering water from these sources could be done by utilizing forward osmosis, a membrane process that exploits the natural osmotic pressure gradient between solutions which requires low energy operation. This study evaluated the potential of forward osmosis (FO) composite membranes fabricated from bacterial cellulose (BC) and modified with sodium alginate. The membranes were evaluated for water flux and salt rejection. The effect of alginate concentrations and impregnation temperatures were evaluated using 0.6 M sodium chloride solution as feed and 2 M glucose solution as the draw solution. The membranes were characterized by Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FTIR), and Contact Angle Meter (CAM). The use of sodium alginate in BC membrane showed a thicker membrane (38.3 μm to 67.6 μm), denser structure (shown in the SEM images), and more hydrophilic (contact angle ranges from 28.39° to 32.97°) compared to the pristine BC membrane (thickness = 12.8 μm and contact angle = 66.13°). Furthermore, the alginate modification lowered the water flux of the BC membrane from 9.283 L/m^2-h (LMH) to value ranging from 2.314 to 4.797 LMH but the improvement in salt rejection was prominent (up to 98.57%).

Keywords: Bacterial cellulose, sodium alginate, forward osmosis, water recovery, composite membrane

1.0 INTRODUCTION

Water is an important requirement to sustain life, the environment, and development; however, water resources are highly vulnerable to stress due to population growth, economic and industrial progress, pollution, and climate change. Four hundred fifty-eight million people from 31 countries since 1995 are currently experiencing water stress [1]. United Nation had predicted that by 2025, this number will increase

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Full Paper

EFFECT OF AGAR-KAOLIN INTERACTION IN GELCASTING MIXTURES ON FORMING OF ALUMINA MEMBRANE SUPPORT

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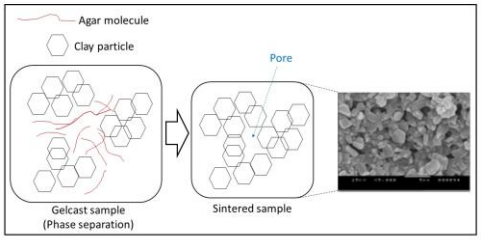
Graphical abstract



Abstract

Disc alumina membrane supports were formed through agar gelcasting method. The agar gelcasting was expected to be environmentally-friendly forming technique using simple equipment. Final agar amounts (0.25 – 0.75wt%) in gelcasting mixtures were varied to find the optimum condition of shaping and the desired microstructure of sintered supports. The gelcasting mixtures were prepared from non-reactive grade Al_2O_3 and porcelain at the ratio of 98.5:1.5 by weight. The porcelain addition allowed the membrane support to have high strength at lower sintering temperature. When the final agar amounts increased from 0.25 to 0.75wt%, the dried, gelcast supports tended to have rough surface and subsequently resulting in crack. TGA profiles confirmed that there was interaction between agar chains and kaolin particles on cooling the gelcast supports leading to different microstructures after sintering. The final agar amount of 0.5 wt% provided the highest porosity of 48.9% and the highest relative density of 61.5%. Additionally, the average pore size of 1.5 µm was obtained at the final agar amount of 0.5 wt% suitable for using as asymmetric membrane support or microfiltration membrane.

Keywords: Agar, gelcasting, ceramic, porous, membrane

1.0 INTRODUCTION

Asymmetric ceramic membrane is usually used for industrial applications, especially for the heat-related and acid/base conditions [1, 2, 3]. In those conditions, polymeric membrane cannot withstand. As a result, the asymmetric ceramic membrane is still favourable, although its cost is high compared with the competitive material. For tubular ceramic membrane, the typical method of forming in large scale production and laboratory is extrusion method [4, 5]. However, the extrusion method needs an extruder offering continuous production and being easy-to-form technique. However, the extruder is very expensive for ceramic factory. Therefore, a new forming method of ceramic membrane support through agar gelcasting is proposed in this work. The new method is expected to be practical alternative to forming tubular ceramic membrane without the extruder.

Agar is a polysaccharide extracted from red algae. Agar is a thermo-reversible and non-toxic gel; therefore, its usage is rather green process compared to conventional, toxic gelcasting [6, 7]. In the development of ceramic fabrication process, agar is utilized for forming Al_2O_3 ceramics [8, 9, 10]. For forming Al_2O_3 ceramics, agar can be mixed with Al_2O_3 slurry in the form of agar solution at a temperature higher than its gelling temperature. The agar gelcasting is thoroughly studied on viscosity, drying shrinkage, green strength and density. Those properties