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# Optimal treatment combination for dishwashing liquid soap based on waste cooking oil according to the requirement of indonesian quality standards

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## Abstract

Much waste cooking oil (WCO) is still discarded even though it can be processed into more valuable products, such as dishwashing liquid soap. The quality of dishwashing liquid soap made from WCO is influenced by the method used, the concentration of potassium hydroxide (KOH) and the adsorption material used. Variations of these three variables produce different qualities. Soap quality is measured based on PH, free alkalis and fatty acids produced. This study uses an experimental design to produce the best combination. The results of the combination will be checked for conformity with the quality standards of SNI 06-2048-1990. The best treatment combination is the cold method, 22.5% KOH

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# Editorial

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# Editorial

It is a new year and hard to tell where we are in right now: Are we in the middle of a pandemic? Are the darkest days behind us? Or is there still harder time in front of us, not bottming out from the tradegy? The good news is that the vaccine rollouts are going on well in the United Kingdom and the United States, while many countries are bracing for the third wave or simply the next wave. The economic damages because of the lockdowns are obvious by looking at the soaring public debts of several countries and the busy agenda of the central bankers. A bigger price to pay is the mental health problems associated with the pandemic. People become angrier, get easily agitated/provoked and more intolerable. One cannot claim that demonstration, violent protests, riotings and lootings for various reasons across the world are because of the mental health problems without thorough and comprehensive studies. The truth, however, is that a calmer head and constructive mindset is essential to lead the way through staying focussed on the tasks at hand. While the world is still leaning on the harsh lessons from Covid-19, it is further exposed by the grounding of a massive cargo ship, the "Ever Given", in the Suez canal disrupting the global maritime trade ($9.4 billion per day; ~$5.1 billion a day for the westbound traffic and $4.5 billion for the eastbound) spiking the oil price 2% over the fear of shortage[1-4]. Remarkably, how such an unusual event can cause significant damage and disruption to our daily life. It further exposes how venerable we are, despite that thousands of satellites are flying around while we can monitor the daily weather (-20 °C high and -72 °C low on the day of writing) on the Red Planet[5]. We hope that science and research can help us understand the wider impact of the mental health and the means to overcome catastrophes and disruptions. "Ever Given" (written as EVERGREEN on its side which is the name of the shipping company[6]) may have stuck, but *EVERGREEN*, Joint Journal of Novel Carbon Resource Sciences & GreenAsia Strategy is not and we are glad with the publication of this edition (Vol. 8, Issue 01) which is the first edition in 2021.

Incidentally, we know the antonym to 'evergreen'; that is 'deciduous'. The former term implies 'sustainabilty' whereas the latter one may imply 'up and dowm' or 'prosperity and withering'. The chaos brought by Covid-19 in politics, economy, culture, academia and every shepre makes us realize a crucially importantnt question; wherter we; mankind, could pave a way to a sustaibale future or not…

Lately, we received some enquires from the concerned authors whether *EVERGEEEN* is or will be indexed by SCOPUS in 2021. We contacted the SCOPUS team and confirmed that *EVERGREEN* is SCOPUS-indexed as of 2021 and will be so for many more years. We realised that such confusion arises because of the phrase on *EVERGREEN* journal source webpage in SCOPUS which states as "Scopus coverage years:from 2014 to 2020". We understand that such statement can be seen on the source page of many other SCOPUS-indexed journals. We learned that SCOPUS updates the source title list twice a year (Apr-May & Sep-Oct). We further scrutinised the status of the indexing status by checking the citation index of journals that are no longer covered by SCOPUS and found out that the citation information is not available unlike *EVERGREEN* where the projected CiteScore is 1.8 for 2020[7]. Hence, we further confirm that *EVERGREEN* is indexed by SCOPUS in 2021. Interested parties can visit the Elsevier website and check out for the "Souce title list" and the "Discontinued sources from Scopus" from this URL https://www.elsevier.com/solutions/scopus/how-scopus-works/content in the "Looking for something else?" section[8].

In this issue, we have original articles, articles from the selected papers from ICEME2020 (Part I) and from IMAT2019 (Part II). One article touches the subject of "Agritourism" studying social capital, collective action, agritourism, and sustainable agriculture in rural areas of Indonesia applying the Mplus-SEM (Structural Equation Model). In the meantime, many people all over the world are learning English while the way we learn have been evolving with the advancements of technology. It is rather interesting how the technology shapes our learning activities. And one article in the present issue discusses on the influence of Technology in learning macro skills of English in a multicultural classroom and presents interesting results. Nowadays, environmental problems, greenhouse gas and global warming are popular keywords while the waste management is becoming crucial to

preserve the environment. We are glad to publish a manuscript which scrutinises the greenhouse gas emission from the integrated solid waste management in Semarang City, Central Java, Indonesia. Another article investigates the outbreak of Covid-19 using fuzzy logic system and comes out with some recommendations. We have three manuscripts that present the statistical analysis of sputtering parameters on superconducting properties of niobium thin film, statistical optimization by response surface methodology of process parameters during the CNC turning operation of hybrid metal matrix composite and the green synthesis silver nanoparticles (AgNPs) using Lamtoro pods extract (Leucaena leucocephala) and their potential for mercury ion detection. We believe that these articles together with the manuscripts from the special issues (please see separate editorials from our guest editors) aim to address the scientific problems and challenges.

In the time of pandemic while several countries are under the lockdowns, most of our colleagues (authors, reviewers and researchers) need to learn to work and adapt to the new way of life (celebrated term is “the new normal”), i.e., work-at-home and/or remote(online) teaching. One needs an immense desire and motivation to write a research paper, and it is easy to decline the invitation for reviewing a manuscript. However, *EVERGREEN* authors and reviewers are exceptional researchers and thanks to their tremendous effort, support and contribution, we are able to publish this issue. *EVERGREEN* greatly appreciate and acknowledge their continued contributions. Unliked many other (paid) journals, *EVERGREEN* is an open access with zero publication fees while our submission system is not an automatic process. Thus, our secretary, Ms Mieko INOUE, has to check all manuscripts for the conformity which is an extremely tedious job and we highly appreciate her judicious effort. Finally, *EVERGREEN* wishes all out there to be safe and healthy, especially, to be in an excellent mental wellbeing (state).

Jun Tanimoto (Editor-in-Chief)

Kyaw Thu (Executive Editor)

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## Editorial from the Guest Editors of ICIMECE 2020

The International Conference on Industrial, Mechanical, Electrical, and Chemical Engineering – ICIMECE is an annual conference organized by the Faculty of Engineering, Universitas Sebelas Maret. The first ICIMECE was held in 2015 which formerly known as IMECE. ICIMECE 2020 was the 6th conference series hold on October 20th, 2020. We had a special collaboration with one big event held by Pembangkit Jawa Bali (PJB) called PJB connect, which also took a role as co-host of ICIMECE 2020.

In the admits of COVID-19 Pandemic, ICIMECE 2020 was held in a virtual format. The new format yet would not reduce our target to make ICIMECE 2020 the forum for sharing and discussing the knowledge, experiences, and results of engineering, science, and technology. ICIMECE 2020 accepted 152 papers for oral presentation at the conference. Ten outstanding papers were selected for possible publication in Evergreen Journal. For the first batch, we have accepted five articles out of ten. These five articles were about the modeling of a photovoltaic system, structural and electrochemical analysis of iron doping in Li-ion battery, anomaly detection on coal-fired power plant, on-grid photovoltaic system power monitoring based on open source and low-cost internet of things platform, and sustainable value stream mapping design of animal feed production process. We hope that their new finding could promote the field's development, which hopefully gives more ideas to the Evergreen readers.

The guest editors express huge appreciation to the Transdisciplinary Research and Education Center for Green Technologies of Kyushu University as the publisher of Evergreen for the collaboration. We extend our gratitude and thanks to the Editor in Chief and Editorial Team for this opportunity to contribute and publish our conference manuscripts for the Special Issue of *EVERGREEN*-ICIMECE 2020. We are also very thankful to the reviewers for their valuable effort and support through comments and advice. We would like to extend our gratitude to the authors who bring their expertise and experience to share the new knowledge in ICIMECE 2020. Besides, we also address thank to all the committee members of ICIMECE 2020 for their essential role and all those involved in organizing the ICIMECE 2020.

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## Editorial from the Guest Editors of IMAT 2019

The 11th International Meeting on Advances in Thermofluids (IMAT) 2019 was held on the 7th and 8th November 2019, at the Kyushu University, Fukuoka, Japan. The IMAT 2019 is the 11th series of conferences first launched in 2008 to foster discussions among researchers, scientists, and engineers, from academia and industry **in a common platform to foster discussion, exchange ideas for the exploration of future research in the fields of fluid mechanics, heat transfer, thermodynamics, combustion, and all topics related to thermal fluids**. 18 presented papers were from Malaysia, 11 of which have been selected for further review and finally accepted for publication in the Evergreen Special Issue.

Articles presented covered topics from microchannels to detonation engines, effectiveness in cooling to heating mechanisms, with research involving theoretical, numerical, and experimental studies. One article looked into wastewater treatment using eggshells while another reported issue with fabrication technology in a thermoacoustic resonator. The topics covered are clearly current issues being investigated by researchers today with continuous efforts towards improving the process and systems in our daily applications.

The guest editors in this special edition would like to express the utmost appreciation to the Transdisciplinary Research and Education Center for Green Technologies of Kyushu University as the publisher of Evergreen for the collaboration, especially to the Editor in Chief for the patience and understanding. We are also very thankful to the Universiti Teknologi Malaysia (UTM) reviewers who have contributed to the manuscript through comments and advice. Additionally, we would also like to extend our gratitude to the authors, the conference committee and the management team to successfully publish this issue. We truly hope that this special issue of Evergreen will contribute to the advancement of scientific findings in the field and provides new knowledge to the Evergreen readers.

**Guest Editor Evergreen Special Issue (IMAT 2019)**

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Volume 8 Issue 2 ( June 2021 )

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EVERGREEN Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy, Vol. 08, Issue 02, pp461-468, June 2021

# Performance Comparative of Modified Jatropha Based Nanofluids in Orthogonal Cutting Process

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**Abstract**: As machining operation is getting crucial, thus nanotechnology has been considered in providing more effective performance to reduce friction coefficient and wear protection of both workpiece and tool. This study investigated effect of an inclusion of solid nanoparticle additives such hexagonal boron nitride (hBN), graphene, copper oxide (CuO) at 0.05 wt.% concentration in modified jatropha (MJO) based oil. The performance of nanofluids was evaluated by conducting friction and wear test via four-ball test as well as machining process through orthogonal cutting process. The attained results were then compared with synthetic ester. This present study revealed the MJO nanofluids (MJO + 0.05 wt.% hBN, MJO + 0.05 wt.% graphene and MJO + 0.05 wt.% CuO) showed higher lubrication performance as compared to the commercial synthetic ester in term of physical properties and tribological behaviour. This condition resulted in the excellent machining performance which was explained by the reduction in maximum cutting temperature, chip thickness, effect of morphology chip and tool-chip contact length. Therefore, the MJO nanofluids can be considered as a potential sustainable metalworking fluid to replace the usage of the currently used synthetic ester in machining operation.

Keywords: Modified jatropha oil, hexagonal boron nitride, graphene, copper oxide, nanofluid, orthogonal cutting

EVERGREEN Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy, Vol. 08, Issue 02, pp484-491, June 2021

# Synthesis and Evaluation of Polysulfone/Chitosan/Polyvinyl Alcohol Integral Composite Membranes for the Removal of Mercury Ion

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**Abstract**: An integral composite membrane was fabricated from a blend of polysulfone/chitosan/polyvinyl alcohol (PVA) at various PVA polymer solution; 1, 3, 4 wt.%. The membranes were characterized in terms of thermal stability, water uptake, and were further evaluated through pure water flux, antifouling properties, and mercury removal. It was found that the composite membranes portrayed good thermal stability with enhanced hydrophilicity. The best performance portrayed by membrane with 4 wt.% PVA with good antifouling behavior, 46% IFR and 56% RFR, and able to remove more than 90% of mercury ions at much low pressure of 4 bars without jeopardizing the flux.

Keywords: composite membrane, characteristics, antifouling, mercury ion removal

EVERGREEN Joint Journal of Novel Carbon Resource Sciences & Green Asia Strategy, Vol. 08, Issue 02, pp477-483, June 2021

# The Effect of Bellmouth Radius and Venturi Restrictor Length on The Power and Torque of BM-9's Engine

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(Received November 20, 2020; Revised May 19, 2021; accepted June 21, 2021).

**Abstract**: One of the rules of Student Formula SAE is air intake must have a restrictor located after the throttle body with 20 mm maximum diameter. It causes engine power and torque decreased. To increase engine performance, modify the bellmouth radius and venturi restrictor length are some of options. The authors analyzed the effect of them on power and torque produced by KTM 450 SX-F engine of Bimasakti UGM's 9th generation car (BM-9). The authors made 9 design variations then simulated by Ricardo Wave 2016.1 and Ansys Fluent 18.1 software. The result is, greater the bellmouth radius and venturi restrictor length produced higher value of peak power and peak torque.

Keywords: Bellmouth; Restrictor; Air Intake; Engine Performance; Ricardo Wave; Ansys Fluent.