

# Impact of instant-controlled pressure drop treatment on thermal properties and microbial decontamination of banana flour

Cite as: AIP Conference Proceedings 2114, 050014 (2019); <https://doi.org/10.1063/1.5112458>  
Published Online: 26 June 2019

Puguh Setyoprato, Akbarningrum Fatmawati, Emma Savitri, Putu Doddy Sutrisna, and Karim Allaf



View Online



Export Citation

**AIP** | Conference Proceedings

Get **30% off** all  
print proceedings!

Enter Promotion Code **PDF30** at checkout



# Impact of Instant-controlled Pressure Drop Treatment on Thermal Properties and Microbial Decontamination of Banana Flour

Puguh Setyoprato<sup>1, a)</sup>, Akbarningrum Fatmawati<sup>1, b)</sup>, Emma Savitri<sup>1, c)</sup>, Putu Doddy Sutrisna<sup>1, d)</sup> and Karim Allaf<sup>2, e)</sup>

<sup>1</sup>*Chemical Engineering Department, Faculty of Engineering, University Surabaya, Surabaya, Indonesia 60293*

<sup>2</sup>*Laboratory Mastering Technology for Agro-Industry, Department of Process Engineering, University of La Rochelle, France*

<sup>a)</sup>Corresponding author: puguhspratomo@gmail.com

<sup>b)</sup>akbarningrum@staff.ubaya.ac.id

<sup>c)</sup>savitri\_ma@staff.ubaya.ac.id

<sup>d)</sup>pudod@staff.ubaya.ac.id

<sup>e)</sup>kallaf@univ-lr.fr

**Abstract.** Banana flour was produced from unripe banana fruit. During the production process, an instant-controlled pressure drop (IPD) treatment was applied to small slices of banana fruit. The treatment was basically a combination of heat and mechanical treatment. The treatment was performed to investigate its impact on the thermal properties and the microbial decontamination of the banana flour. The analysis of differential scanning calorimetry showed that the IPD treatment resulted in a higher gelatinization temperatures of the banana flour product. The gelatinization temperatures of the IPD treated banana are the initial temperature 12.53 °C, the peak temperature 63.10 °C, and the final temperature 155.41 °C. It was found that IPD treatment was superior in reducing the number of bacteria in the banana. It was also found that the addition of IPD treatment time will reduce the number of microbial colonies in banana.

## INTRODUCTION

Banana is a common name encompassing many species in the genus *Musa* from *Musaceae* family. Bananas are plants that can grow easily in tropical and subtropical regions. Banana cultivation requires low investment yet it quickly brings in an income. The banana plantation can be developed in both the lowlands and highlands. In Indonesia, banana cultivation is practiced in almost all rural agricultural areas. Because of its natural characteristics, banana quality will deteriorate quickly during storage. Storage at low temperatures is initially considered as a promising method for extending the durability of the freshly harvested bananas. But apparently, by applying such method, bananas experience chilling injuries, including prevented ripening, when stored at low temperatures [1]. In the ripening period, which is also called as climacteric stage, the biochemical composition of the banana fruit is changed due the occurrence of simultaneous biochemical processes, including degradation of the starch, starch hydrolysis which produces sugar, and synthesis of bioactive molecules e.g., polyphenol compound [2].

Nowadays, there is growing awareness from researchers to develop technology or process that can avoid the losses in the post-harvest period of banana fruit. Producing banana flour from unripe banana fruit is perceived as one of the reliable method to avoid losses in post-harvest. Recently, the use of unripe banana flour as functional food ingredient is growing rapidly. It is because of its attractive nutritional value, especially its rich in indigestible carbohydrates and mainly its high content of resistant starch and dietary fiber. Another advantageous are the banana

flour rich in bioactive compounds, e.g., phenolic compounds, which will act as antioxidant and have a much longer shelf life than the ripe banana fruit [3-6]. Banana flour has been used as one of the ingredients in several commercial food products, including slowly digestible cookies [7]; pasta, especially spaghetti [8]; yoghurt, fruit bar, infant foods, noodles, chips, ice cream, muffins, confectioneries, and jam [9].

Various technology processing have been developed to produce banana flour, including pretreatment using organic acids, i.e., ethylene diamine tetra acetic acid, benzoic acid and sorbic acid, to inhibit browning due to enzyme activity, and other biochemical and microbial degradation during flour production [10]; production of high resistant starch content of unripe banana flour by controlling the process temperature below the gelatinization temperature [11]; agglomeration process in a pulsed-fluidized bed agglomeration to increase the flow ability of the green banana flour product dietary fiber and phytochemical bioactivity enrichment of unripe banana flour by mechanically fractionation [12]; and improvement of functional properties, pasting properties and digestibility of green banana flour by application of heat moisture treatment, annealing and retro gradation [13]. In the present work, an instant-controlled pressure drop (IPD) treatment, which is basically a simultaneous mechanical and heat treatment, is applied on thin slices of unripe banana before the final dehydration process. The goal is to observe the impact of the IPD treatment on the thermal properties, namely its gelatinization temperatures and the microbial decontamination level of the banana flour product.

## MATERIALS AND METHODS

### Raw Material

Unripe banana (*Musa sp*) was purchased from a local market. Bananas were then peeled and cut into thin slices at 16x16x2 mm mm<sup>3</sup>. *Rappaport Soy Broth* (RV), *Selenite Cystine Broth* (SC), *Lactose Broth* (LB), *Xylose Lysine Deoxycholate agar* (XLD agar), *Triple Sugar Iron agar* (TSI agar) and *Lysine Iron agar* (LIA agar) were purchased from Merck, Germany; *Brilliant Green agar* (BGA agar) was purchased from Pronadisa, Spain; and Peptone was purchased from Himedia, India.

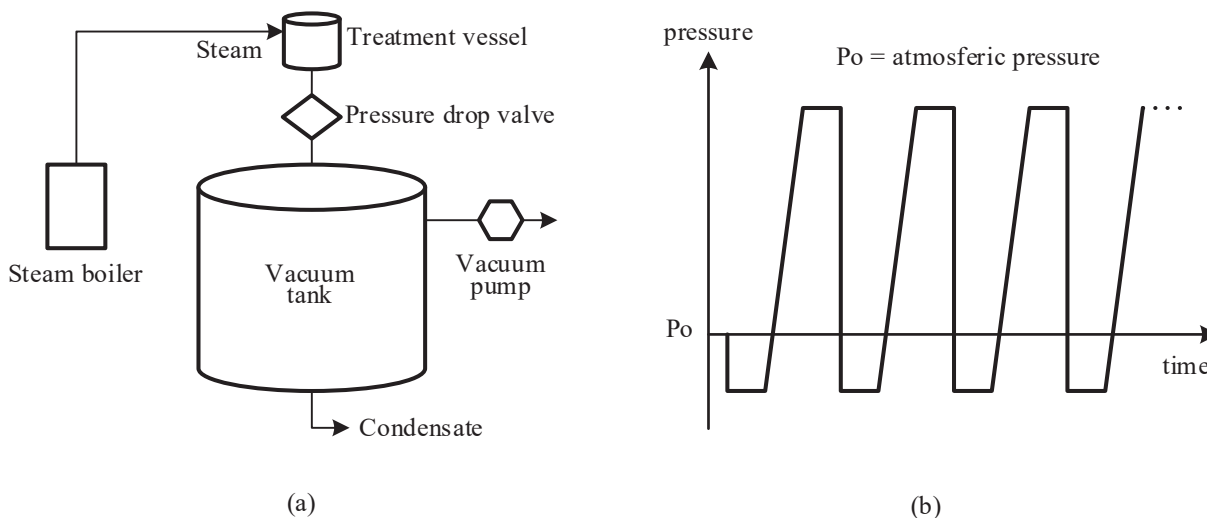
### Dehydration Method

There are two stages of dehydration, namely initial and final dehydration. Both stages of dehydration were carried out on the same device: a convective hot air dryer (Mettmert UFE 600). The banana slices were spread in 1-layer above the dryer tray. The air flow, which was maintained at a temperature of 50 °C, flew through the tray creating convective mass and heat transfer. In the initial dehydration stage, the banana slices were dehydrated to reduce the water content up to 20% (wet basis). This initial dehydration was carried out to make the banana slices physically strong enough against the mechanical and heat action experienced during the IPD treatment. Meanwhile, in the final dehydration, the processed banana slices was dehydrated until the moisture content reaches 7% (wet basis) before being crushed into flour. As a comparison, there were samples that were not treated with the IPD, so the dehydration was only completed at one stage. For these samples, the dehydration was carried out using the oven or air-dried outside under the Sun.

### Instant-controlled Pressure Drop Treatment

The IPD treatments were carried out using a set of apparatus as shown in Fig. 1 (a). Basically, the apparatus consisted of treatment vessel, pressure drop valve, vacuum tank, vacuum pump and steam boiler. The treatment vessel has 1 liter volume, while the vacuum tank has around 60 fold volume of the treatment vessel to facilitate an instant pressure drop. A certain quantity of sample was placed in a perforated sample holder then it was inserted in the treatment vessel, while the pressure drop valve was closed. Water steamed from the boiler was then injected to the treatment vessel and held at a certain pressure for a few seconds. The pressure drop valve was then suddenly opened and produced an instant pressure drop in the treatment vessel from high pressure to vacuum pressure in less than one second. This cycle was repeated as needed. The pressure fluctuation in the treatment vessel is typically

presented in Fig. 1 (b). In the present work, one cycle of IPD was applied. The pressure of the steam applied in the treatment sample was 2.7 bar, while the treatment time was varied at 10, 20, 30, 40, 50 and 60 seconds. The instant pressure dropped suddenly, bringing down the pressure at the treatment sample from 2.7 bar to 0.005 bar.



**FIGURE 1.** (a) The schematic diagram of the apparatus to create instant-controlled pressure drop; (b) Typical pressure fluctuation cycles in the treatment vessel.

### Thermal Properties Measurement

The thermal properties were measured using a Differential Scanning Calorimetry (DSC) Mettler Toledo Star System. The measured parameters were the initial, peak, and completion/end set gelatinization temperatures as well as the gelatinization enthalpy.

### Determination of the Number of Microbial Colony by Pour Plate Counting

Twenty-five grams of the banana slices were fed to 225 ml of 0.85% w/v NaCl solution and 0.1% peptone. This mixture was blended for approximately 2 (two) minutes to crush the banana into pieces. Subsequently, a series of dilutions was carried out by taking 1 ml of the liquid sample and diluting to 10 ml in a diluents tube. The dilution was continued by taking 1 ml of liquid from the first diluents tube and diluting again to 10 ml in a second diluents tube. Dilution was carried out until the concentration of the sample  $10^{-6}$  times the initial concentration. From each diluents tube, 0.1 ml of liquid was taken and transferred to a petri dish. Furthermore, as much as 10-15 ml of the molten agar medium (plate count agar) at a temperature of  $\pm 45^{\circ}\text{C}$  was poured into the petri dish that had filled with the sample liquid. Rotate all the plates to achieve a better mixing.

The remaining medium was then poured into an empty cup as a blank. The blank was incubated together with the sample. If there was a growth of microorganisms on the blank, it means that the agar had been contaminated and all results could not be used. After solidifying, the cup was reversed, and incubated at  $35^{\circ}\text{C}$  for 48 hours. After 48 hours incubation, the number of microorganism colonies was calculated. To find out whether there was a fungus on the banana samples, the petri dish was incubated again for 48 hours. The presence of fungal or mold growth was observed after 96 hours incubation.

### Isolation and Identification of *Salmonella*

Twenty-five grams of banana flour samples were fed to 225 ml of *Lactose Broth* (LB) containing pancreatic digestion gelatin, lactose monohydrate, and beef extract. This mixture was continuously stirred and incubated at

35°C for one day. As much as 1 ml of the incubated mixture was taken and dissolved in *Rappaport Soy Broth* (RV) and *Selenite Cystine Broth* (SC), then incubated at 35°C for one day. Each of incubated RV and SC solution was taken and then scratched on a *Brilliant Green* agar (BGA) and XLD agar using a loop. BGA and XLD media were used as selective media for *Salmonella* bacteria. The results of the scratches were incubated at 35°C for one day. After incubation, the results of this scratch were grouped based on the color of media and colony. Microbes that grew on XLD and BGA were taken using a needle and then inserted into *Triple Sugar Ironagar* (TSI agar) and *Lysine Ironagar* (LIA agar). The TSI agar and LIA agar were incubated at 35°C for one day.

After incubation for 24 hours, an analysis was carried out by observing the color changes in TSI agar and LIA agar. On the TSI agar, the occurrence of glucose, lactose, and/or sucrose fermentation, and production of H<sub>2</sub>S was examined. The red color showed the base reaction (B), while the yellow color showed the acid reaction (A). Formation of H<sub>2</sub>S was marked by the appearance of black color. Red color (B) on the surface and yellow (A) at the bottom indicated glucose fermentation, but not lactose and sucrose. The yellow color on the surface and bottom showed the occurrence of glucose, lactose and/or sucrose fermentation. The reaction that occurred in TSI agar by *Salmonella* bacteria was characterized by the occurrence of red color on the slant (inclined agar) and the butt (the base of the inclined agar), and there were black spots on the slant. Whereas in the LIA agar, the occurrence of *Salmonella* was marked by the change in media from color to red and the appearance of black spots.

## RESULTS AND DISCUSSION

### The Thermal Properties

Starch, when heated in the presence of excess water, will undergo the phase of transformation from order to disorder arrangement. Such transition is known as gelatinization that will happen over a temperature range, which is typical of starch sources. This phase is associated with diffusion of water into the granule, water uptake by the amorphous background region, hydration and radial swelling of the starch granules, loss of birefringence, loss of crystalline order, uptake of heat, uncoiling and dissociation of double helices in the crystalline regions, and amylose leaching [14]. Gelatinization is followed by pasting. The gelatinization process, which is a function of the starch's water ratio, can be detected by a differential scanning calorimetry (DSC). Initial (To), peak (Tp), and completion/endset (Te) gelatinization temperatures can be obtained from DSC thermograms.

The thermograms of DSC analysis of the banana flour, both without IPD treatment - sun dried sample, without IPD treatment – oven dried sample, and with IPD treatment – oven dried sample, were summarized on Table 1 in terms of the gelatinization temperature and enthalpy. Without IPD treatment – oven dried banana samples are the samples which were conventionally dried in oven at 50°C without insertion of IPD technology during the dehydration process. Meanwhile, without IPD treatment - sun dried banana samples were obtained by exposed the banana slice to the sun outside, and it need three days exposure to reach the desired final moisture content. As expressed on the table, it can be seen that the banana with IPD treatment had higher gelatinization temperatures, with an initial granule gelatinization temperature (To) of 12.53 °C, a peak temperature (Tp) of 63.10 °C and a final temperature (Te) of 155.41 °C. These temperatures are higher than result of banana flour without IPD treatment, i.e.: for sun dried sample 6.28, 47.60 and 110.59 °C and for oven dried sample 6.28, 47.60 and 110.59 °C. It means that the banana flour with IPD treatment required higher temperatures to ensure complete gelatinization and pasting than two other products. The lower reducing sugar content due to enzyme deactivation during IPD treatment can be a reason of the higher gelatinization temperature. Flour with higher gelatinization temperature is preferred for producing food products in which delayed pasting is desired, such as in retorted canned foods.

Furthermore, banana flour with IPD treatment required more energy to gelatinize (122.95 J/g gelatinization enthalpy) than without IPD - sun dried banana flour (184.16 J/g gelatinization enthalpy) and required less energy to gelatinize than without IPD - oven dried banana flour (235.97 J/g gelatinization enthalpy).

**TABLE 1.** Gelatinization temperature and enthalpy of banana flour with different treatments

| Gelatinization Temperature & Gelatinization Enthalpy | Without IPD - Sun Dried | Without IPD - Oven Dried | With IPD - Oven Dried |
|--|-------------------------|--------------------------|-----------------------|
| Onset To (°C)  | 6.28                    | 5.83                     | 12.53                 |
| Peak Tp (°C)   | 47.60                   | 42.74                    | 63.10                 |
| End set Te (°C)                                      | 110.59                  | 105.92                   | 155.41                |
| Enthalpy (ΔH, J/g)                                   | 184.16                  | 235.97                   | 122.95                |

### Microbial Decontamination

The impact of the IPD treatment in regard with microbial decontamination was investigated by measuring the microbial content in the sample before and after IPD treatment. Total plate count method was used to perform the measurement. The result of microbial content measurement, expressed in CFU (Colony Forming Unit)/25 g of sample, for banana sample with IPD treatment – oven dried, without IPD treatment – oven dried, and without IPD treatment - sun dried were presented on Table 2. For banana with IPD treatment, the treatment time was varied to be 10, 20, 30, 40, 50 and 60 seconds.

**TABLE 2.** Comparison of the microbial content at different treatment methods

| Treatment Method                                  | Microbial Content(CFU/25 g) at Various IPD Treatment Time |        |        |        |        |        |
|---|---|--------|--------|--------|--------|--------|
|   | 10 (s)  | 20 (s) | 30 (s) | 40 (s) | 50 (s) | 60 (s) |
| With IPD treatment (130 °C -2.7 bar) – Oven Dried | 600   | 200    | 100    | 50     | 0      | 0      |
| Without IPD treatment – Oven Dried                |   |        |        | 16,000 |        |        |
| Without IPD treatment – Sun Dried                 |   |        |        | 2,000  |        |        |

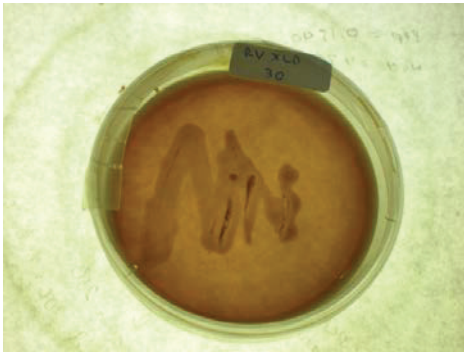
The table exhibits the effect of treatment time of the IPD technology on the microbial content of the banana flour. The results above show that the longer the IPD treatment time, the lesser the microbial colony number of banana flour. The long contact time of the food material (banana) to the steam increases the efficacy of the IPD technology in regard with microbial decontamination. The table also shows the superiority of the IPD treatment over the two other treatment methods in reducing the food microbial content. The low microbial content of banana flour with IPD treatment would help prolong the shelf time of banana product.

The banana flour obtained from the three applied treatment was analyzed for *Salmonella* identification. This analysis used Xylose Lysine Deoxycholate (XLD) agar selective medium in which *Salmonella* will de-carboxylate lysine to reach neutral pH of 7.4. Over this neutral pH, *Salmonella* can produce H<sub>2</sub>S from thiosulphate reduction. The decarboxylation reaction is as follows:

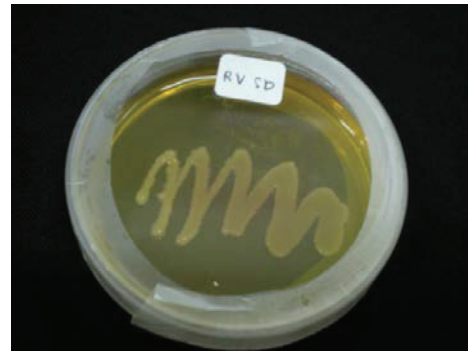


The XLD agar contains three sugars (lactose, sucrose and xylose) and amino acid lysine. Certain bacteria, such as *Salmonella* and *Citrobacter* that are grown on this XLD agar can degrade the sugars to produce acid, which will exhibit color change of indicator from red to yellow. Lysine decarboxylation into cadaverine will cause the medium surrounding the growing colony to be reddish purple because of the increase of pH. The alkaline reaction of this lysine decarboxylation can then be neutralized by the acid produced from xylose metabolism. Normally, in the BGA agar, *Salmonella* cannot ferment sucrose or lactose, and result in red colonies surrounded by red zone.

In the present research, the *Salmonella* identification of the banana flour using both XLD and BG agar show negative results. The 48 hour incubated sample showed yellowish white opaque colonies (Fig. 2 and 3). These colonies may be *E. coli*, *Enterobacter*, *Serratia*, or *Klebsiella*.



**FIGURE 2.** Colonies on the XLD agar (*Salmonella* negative).



**FIGURE 3.** Colonies on the BGA agar (*Salmonella* negative).

In order to strengthen the results from XLD and BG agar incubation, the colonies from those selective media were transferred into slant differential agar of *Triple Sugar Iron* agar (TSI agar) and deep *Lysine Iron* agar (LIA agar). Over growing on the TSI medium, *Salmonella* will ferment glucose so that acid is produced at the bottom of the slant agar called butt. This acid production will cause the medium color to change into red. *Salmonella* will also produce H<sub>2</sub>S gas, which is marked by black dots on the slant. The result obtained from this analysis shows the yellow colonies on the slant and the butt (Fig. 4). These colonies may be the result of glucose and lactose or sucrose fermentation by *Hafnia*, *Klebsiella*, *Staphilococcus*, *Streptococcus*, and *Serratia* bacteria. The growth of *Salmonella* on the LIA medium resulted in the color change into red with black dots as a result of lysine decarboxylation activity. In this research, the result of analysis using LIA indicated the medium color change into purple and yellow, which proved that the sample did not contain *Salmonella* (Fig. 5).



**FIGURE 4.** Result of *Salmonella* identification on the TSI agar (*Salmonella* negative).



**FIGURE 5.** Result of *Salmonella* identification on LIA agar (*Salmonella* negative).

The results of *Salmonella* identification showed that there were no *Salmonella* colonies found on the banana sample both with and without IPD treatment. Such results may ne also supported by clean environment and negligible load of *Salmonella* on the raw material.

## CONCLUSION

The impact of the instant-controlled pressure drop on the melting properties and microbial decontamination of banana flour has been investigated. The analysis of banana flour thermal properties by a differential scanning calorimetry showed that the banana flour with the treatment of instant-controlled pressure drop (IPD) had higher gelatinization temperatures. The banana flour with IPD treatment requires more energy to gelatinize than without IPD treatment and sun dried, and required less energy to gelatinize than without IPD treatment and oven dried. It found the superiority of the instant-controlled pressure drop treatment over those without instant-controlled pressure drop treatment, in terms of reducing the food microbial content. It also found that that the longer the instant-controlled pressure drop treatment duration, the lesser the microbial colony number of banana flour. Furthermore, *Salmonella* identification also indicates that the produced banana flour do not contain any *Salmonella*.

## ACKNOWLEDGMENTS

The authors wish to thank Christine Kusumawati T. and Ivone Felicia for their involvement and support in this research work.

## REFERENCES

- [1] Y. M. Jiang, D.C. Joyce, W. B. Jiang and W.J. Lu, Effects of Chilling Temperatures on Ethylene Binding by Banana Fruit, *Plant Growth Regul.*, 43, 109-115 (2004).
- [2] A. Campuzano, C.M. Rosell and F. Cornejo, Physicochemical and nutritional characteristics of banana flour during ripening, *Food Chem.*, 256, 11-17 (2018).
- [3] C. Sarawong, R. Schoenlechner, K. Sekiguchi, E. Berghofer and Perry K.W. Ng, Effect of extrusion cooking on the physicochemical properties, resistant starch, phenolic content and antioxidant capacities of green banana flour, *Food Chem.*, 143, 33-39 (2014).
- [4] F.M. Pelissari, M.M.A. Mahecha, P.J.A. Sobral and F. C. Menegalli, Comparative study on the properties of flour and starch films of plantain bananas (*Musa paradisiaca*), *Food Hydrocolloids*, 30, 68-690 (2013).
- [5] A. Orsuwan and R. Sothornvit, Development and characterization of banana flour film incorporated with montmorillonite and banana starch nanoparticles, *Carbohydr. Polym.*, 174, 235-242 (2017).
- [6] Y. Bi, Y. Zhang, H. Jiang, Y. Hong, Z. Gu, L Cheng, Z. Li and C.Li, Molecular structure and digestibility of banana flour and starch, *Food Hydrocolloids*, 72, 219-227 (2017).
- [7] A.A. Saguila'n, S.G.S Ayerdi, A.V. Torres, J. Tovar, T.E.A. Otero and L.A.B. Pe'reza, *J. Food Compos. Anal.*, 20, 175-181 (2007).
- [8] M.O. Martinez, S.S. Ayerdi, E.A. Acevedo, I. Goñi and L.A.B. Pérez, Unripe banana flour as an ingredient to increase the undigestible carbohydrates of pasta, *Food Chem.*, 113, 121-126 (2009).
- [9] T.A. Anyasi, A.I.O. Jideani and G.R.A. Mchau, Phenolics and essential mineral profile of organic acid pretreated unripe banana flour, *Food Res. Int.*, 104, 100-109 (2018).
- [10] T.A. Anyasi, A.I.O. Jideani and G.R.A. Mchau, Effect of organic acid pretreatment on some physical, functional and antioxidant properties of flour obtained from three unripe banana cultivars, *Food Chem.*, 172, 515-522 (2015).
- [11] F.A.H. Sardá, F.N.R. Lima, N.T.T. Lopes, A.O. Santos, E.C. Tobaruela, E.T.M. Kato and E.W. Menezes, Identification of carbohydrate parameters in commercial unripe banana flour, *Food Res. Int.*, 81, 203-209 (2016).
- [12] C. Segundo, L. Román, M. Gómez and M.M. Martínez, Mechanically fractionated flour isolated from green bananas (*M. cavendishii* var. *nanica*) as a tool to increase the dietary fiber and phytochemical bioactivity of layer and sponge cakes, *Food Chem.*, 219, 240-248 (2017).
- [13] Y. Cahyana, E. Wijaya, T.S. Halimah, H. Marta, E. Suryadi and D. Kurniati, The effect of different thermal modifications on slowly digestible starch and physicochemical properties of green banana flour (*Musa acuminata* colla), *Food Chem.*, 274, 274-280 (2019).
- [14] I.D. Evans and D.R. Haisman, The Effect of Solutes on the Gelatinization Temperature Range of Potato Starch, *Starch*, 34, 224-231 (1982).



# Exploring Resources, Process and Design for Sustainable Urban Development

Proceedings of the 5th International  
Conference on Engineering, Technology,  
and Industrial Application (ICETIA) 2018

---

Surakarta, Indonesia • 12–13 December 2018

**Editors** • Anto Budi Listyawan, Nurul Hidayati,  
Wisnu Setiawan, Tri Widodo Besar Riyadi,  
Hari Prasetyo, Munajat Tri Nugroho and Nur Hidayati



# ICETIA



[i](#) [x](#)


**Data Science Program by IIT**  
**Executive PG Certificate**  
 12 Months Online Executive PG Certificate.13500+ Students Empowered. 18+ Industry Projects

cloudxlab.com OPEN

# AIP Conference Proceedings

**COUNTRY**

United States

 Universities and research institutions in United States

**SUBJECT AREA AND CATEGORY**

Physics and Astronomy  
Physics and Astronomy (miscellaneous)

**PUBLISHER**

American Institute of Physics

[i](#) [x](#)

**Data Science Program by IIT**  
**Executive PG Certificate**  
 12 Months Online Executive PG Certificate. 13500+ Students Empowered. 18+ Industry Projects

cloudxlab.com OPEN

**PUBLICATION TYPE**

Conferences and Proceedings

**ISSN**

0094243X, 15517616

**COVERAGE**

1974-1978,  
  
1983-1984,  
1993,  
2000-2001,  
2003-2020





SCOPE

Today, AIP Conference Proceedings contain over 100,000 articles published in 1700+ proceedings and is growing by 100 volumes substantial body of scientific literature is testament to our 40-year history as a world-class publishing partner, recognized internationally by conference organizers worldwide. Whether you are planning a small specialist workshop or organizing the largest international contact us, or read these testimonials, to find out why so many organizers publish with AIP Conference Proceedings.

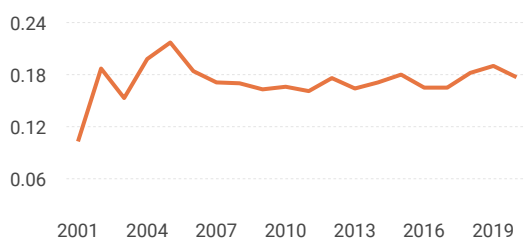
Join the conversation about this journal

# International Academic Conference on Economics, Business Management & Social Sciences

Of

Conference Alerts

SJR

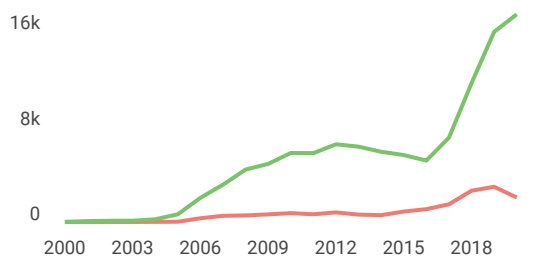


Total Documents



Total Cites

Self-Cites

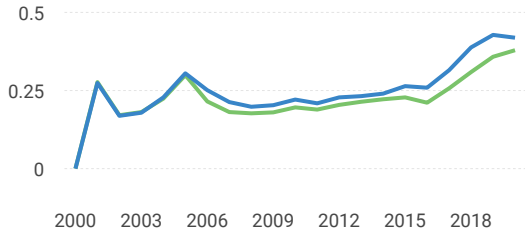


Citations per document

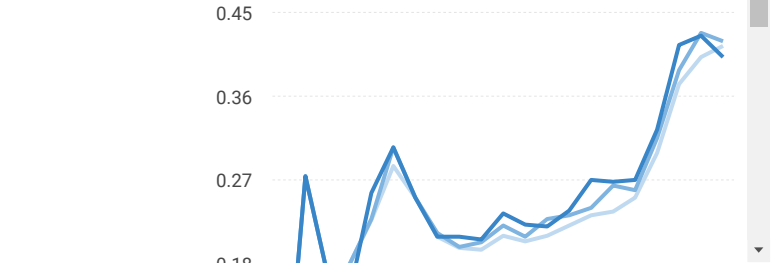
External Cites per Doc

Cites per Doc



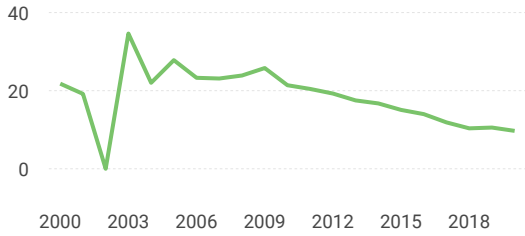


% International Collaboration



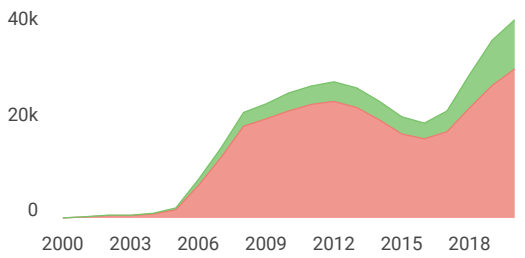
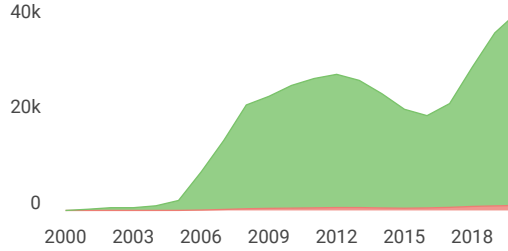
Citable documents

Non-citable documents



Cited documents

Uncited documents



**AIP Conference Proceedings**

← Show this widget in your own website

Not yet assigned quartile

SJR 2020  
0.18

powered by scimagojr.com

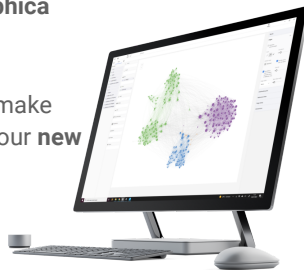
Just copy the code below and paste within your html code:

```
<a href="https://www.scimaç
```

**SCImago Graphica**

Explore, visually communicate and make sense of data with our **new free tool**.

Get it



# International Academic Conference on Economics, Business Management & Social Sciences

Conference Alerts

Metrics based on Scopus® data as of April 2021

D **Dr Kumutha D** 3 months ago

Dear Sir,  
Greetings!!!!

What is the Q value? Because, in our institution Q1, Q2, Q3 is very much necessary...  
Through conference i planned to submit a paper... Please let me know

Thanks

reply



**Melanie Ortiz** 3 months ago

SCImago Team

Dear Dr Kumutha,  
Thank you for contacting us. Please see comments below.  
Best regards, SCImago Team

F **Fathi awad** 4 months ago

Hi  
I am asking about the Q factor for AIP proceedings.

Thank you very much

reply



**Melanie Ortiz** 4 months ago

SCImago Team

Dear Fathi,  
Thank you for contacting us. Please see comments below.  
Best Regards, SCImago Team

G **Ghazwan Jreou** 5 months ago

Dear sir  
respects  
would you please let me know in which Q is your journal (conferences and proceeding) classified?  
according to Scopus Q classification list .  
with regards.

reply



**Melanie Ortiz** 5 months ago

Dear Ghazwan,  
Thank you for contacting us. We calculate the SJR data for all the publication's types, but the Quartile's data are only calculated for Journals and Book Series.  
Best regards, SCImago Team

A **ASHOK KUMAR K** 7 months ago

As per the information in SJR portal the coverage period for AIP conference proceedings is up to 2020. I want to know whether the period of validity or coverage gets extended or not? If gets extended when can we see those updates in the SJR portal?

reply



**Melanie Ortiz** 7 months ago

Dear Ashok,  
Thank you very much for your comment.  
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. Therefore, the indicators for 2020 will be available in June 2021.  
We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.  
Best Regards, SCImago Team

K **Kay** 10 months ago

My university is going to organise a conference in social science on 27-28 Oct 2021. We would like to publish our conference papers in your proceeding as our official proceeding. What are the procedures and publication fees?

Regards.

reply



**Melanie Ortiz** 10 months ago

Dear Kay,  
thank you for contacting us.  
We are sorry to tell you that SCImago Journal & Country Rank is not a publication. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.  
Unfortunately, we cannot help you with your request, we suggest you visit the homepage or contact the editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

R **Ruslan** 11 months ago

I have published articles on AIP, but until now I have not received confirmation for my Scopus ID, please explain. thank you

reply



**Melanie Ortiz** 11 months ago

SCImago Team

Dear Ruslan,  
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you contact Scopus support:  
[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team

V **Vikas** 1 year ago

currently, the journal is not assigned quartile (Q indexing). When we can expect the assignment.

reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Vikas,  
Thank you for contacting us. We calculate the SJR data for all the publication's types, but the Quartile's data are only calculated for Journals and Book Series.  
Best regards, SCImago Team

S **Siddik** 1 year ago

This will come under scopus journal list?

reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Siddik,  
Thank you very much for your comment.  
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's data. The SJR for 2019 was updated on June 2020, 11. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.  
Best Regards, SCImago Team

H **Hassan Yassein** 1 year ago

ISSN of this journal different of ISSN in Scopus, although the data of SJR depends on the scopes

reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Hassan,  
Thank you for contacting us.  
SJR is a portal with scientometric indicators of journals indexed in Scopus. All the data (Title, ISSN, etc.) have been provided by Scopus /Elsevier and SCImago doesn't have the authority over this data which are property of Scopus/Elsevier. SCImago has a signed agreement that limits our performance to the generation of scientometric indicators derived from the metadata sent in the last update (April/May 2020).

The next SCImago update will be made throughout June 2020 with the new update sent by Scopus. We suggest you wait for that date in order to see if there are any changes regarding this matter.

Best Regards, SCImago Team



**Khairil** 1 year ago

Is this proceeding ranked Q4?

reply

A

**ali mohammed** 2 years ago

why this journal dont have any rank yet ?  
it is dont belong to Q1,2,3,4 ?

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Ali,  
Thank you for contacting us. We calculate the SJR data for all the publication types, but the Quartile data are only calculated for Journal type's publications. Best regards,  
SCImago Team

A

**Akshya Sekar** 2 years ago

Hi mam/sir,  
I want to know whether this AIP conference proceeding is indexed in SCI or not?

Thanks



reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Akshya,  
Thank you for contacting us. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request referring the index status. We suggest you to consult Scopus database (see the current status of the journal) or other databases (like WoS). Best Regards, SCImago Team



**Khairil** 2 years ago

Your IP (036.071.233.236) is blocked.  
Block Reason: This IP was identified as infiltrated and is being used by sci-hub as a proxy.

How to unblock this my IP for access AIP site?

thanks

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Khairil,  
thank you for contacting us.  
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.  
Unfortunately, we cannot help you with your request, we suggest you to contact the journal's editorial staff by e-mail. Best Regards, SCImago Team

**D Duha Ahmed** 2 years ago

dear Admin  
about the AIP Conference Proceeding can you see the Scopus site because the date end to 2019 is there any update about this time or change it to 2020 in the near future and you will see it in the site of Scopus  
<https://www.scopus.com/sourceid/26916>

I hope the AIP Conference Proceeding is still in the Scopus for 2020  
with my best wishes  
Miss Duha

reply



**Melanie Ortiz** 2 years ago

Dear Duha,

Thank you for contacting us. Unfortunately, we cannot see what will happen in the future with this journal. Best Regards, SCImago Team

M **mohammed** 2 years ago

Is the ( AIP Conference Proceeding ) out of Scopes because I tried to search for it in Scopes and I did not find it  
Please answer me

reply



**Melanie Ortiz** 2 years ago

Dear Mohammed,

thank you for contacting us. You can find it in Scopus:  
<https://www.scopus.com/sourceid/26916>

Best Regards, SCImago Team

T **Thanh Quang Khai Lam** 2 years ago

Dear Elena Corera!  
Can you tell me "Lecture notes in civil engineering" in Q4?  
i don't see in Scimago.  
Thank you

reply



**Melanie Ortiz** 2 years ago

Dear Thanh,

Thank you for contacting us. We calculate the SJR data for all the publication types, but the Quartile data are only calculated for Journal type's publications. Best regards,  
SCImago Team

T **Teo Jin Chuan** 2 years ago

Dear Admin,

Can i know is this journal Q1,Q2,Q3 or Q4. Thank you.

Regards

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Teo, thank you very much for your request. You can consult that information in SJR website. Best Regards, SCImago Team

H **Hassan Abdulhadi** 3 years ago

I ASKE ABOUT AIP CONFERENCE PROCEEDINGS WITHIN SCOPUS OR THOMSON REUTERS WITH BEST WISHES

reply

H **Hassan Abdulhadi** 3 years ago

I ASKE ABOUT AIP CONFERENCE PROCEEDINGS WITHIN SCOPUS OR THOMSON REUTERS WITH BEST WISHES



**Elena Corera** 3 years ago

SCImago Team

Dear Hassan,

thank you for your request, all the journals included in SJR are indexed in Scopus. Elsevier / Scopus is our data provider.

Best Regards,  
SCImago Team

T **Tarik** 3 years ago

Dear. Elena  
Hi

Please can we concedar AIP conference proceeding as journal .What i mean ,the publication type could be journal of AIP conference proceedings .

Best regards

Tarik AlOmran

reply



**Elena Corera** 3 years ago

Dear Tarik,

thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact journal's editorial staff so they could inform you more deeply. You can find contact information in SJR website <https://www.scimagojr.com>

Best regards,  
SCImago Team

D **Dunia** 3 years ago

dear

did the AIP conference (TMREES 18) have Thomson roeters or scopus or SJR Rank or not?

reply



**Elena Corera** 3 years ago

Dear Dunia,

thank you very much for your comment. SCImago Journal & Country Ranks shows all the journal's available information in Open Access. If you do not locate the journal in the search engine, Scopus / Elsevier has not provided us those data.

Best Regards,  
SCImago Tea

B **Budi Adiperdana** 3 years ago

Dear Admin,

Could you please add the Quartile Rank for AIP Conference Proceedings

Best regards,  
Budi

reply



**Elena Corera** 3 years ago

Dear Budi, for Conferences and Proceedings the SJR is not calculated. Best Regards,  
SCImago Team

**Leave a comment**

Name

Email

(will not be published)

 I'm not a robot reCAPTCHA  
Privacy - Terms

Submit

The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.

Developed by:



Powered by:

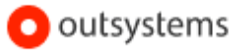


Follow us on @ScimagoJR

Scimago Lab, Copyright 2007-2020. Data Source: Scopus®

**EST MODUS IN REBUS**

Horatio (Satire 1, 1, 106)



App Template  
Employee Directory  
Web and Native Mobile



# AIP Conference Proceedings

HOME

BROWSE

MORE ▾

## Table of Contents

### EXPLORING RESOURCES, PROCESS AND DESIGN FOR SUSTAINABLE URBAN DEVELOPMENT: Proceedings of the 5th International Conference on Engineering, Technology, and Industrial Application (ICETIA) 2018

< PREV NEXT >



Conference date: 12-13 December 2018

Location: Surakarta, Indonesia

ISBN: 978-0-7354-1850-9

Editors: Anto Budi Listyawan, Nurul Hidayati, Wisnu Setiawan, Tri Widodo Besar Riyadi, Hari Prasetyo, Munajat Tri Nugroho and Nur Hidayati

Volume number: 2114


Published: Jun 26, 2019

DISPLAY : 20 50 100 all

## PRELIMINARY



BROWSE VOLUMES


 Free . June 2019

## **Preface: Exploring Resources, Process and Design for Sustainable Urban Development**

AIP Conference Proceedings 2114, 010001 (2019); <https://doi.org/10.1063/1.5112384>

⋮

## **SUSTAINABLE INDUSTRIAL PROCESS AND SYSTEM OPTIMIZATION**

 Free . June 2019


### **Multi-response optimization of cutting force and surface roughness in carbon fiber reinforced polymer end milling using back propagation neural network and genetic algorithm**

Philipus Andreas Lega Laot, Suhardjono, Sutikno and Sampurno

AIP Conference Proceedings 2114, 020001 (2019); <https://doi.org/10.1063/1.5112385>

SHOW ABSTRACT

⋮

 Free . June 2019


### **The effect of white soil as stabilizer for expansive soil in index and engineering properties of soil**

Undayani Cita Sari, Sri Prabandiyani Retno Wardani and Muhrozi

AIP Conference Proceedings 2114, 020002 (2019); <https://doi.org/10.1063/1.5112386>



BROWSE VOLUMES

 Free . June 2019


## **Multi response optimization in vulcanization process using backpropagation neural network-genetic algorithm method for reducing quality loss cost**

Zain Amarta, Bobby Oedy Pramoedyo Soepangkat, Sutikno and Rachmadi Norcahyo

AIP Conference Proceedings **2114**, 020003 (2019); <https://doi.org/10.1063/1.5112387>

SHOW ABSTRACT



 Free . June 2019


## **Development of road condition database based on geographical information system and pavement condition index method**

Sumarwan, Sri Sunarjono, Agus Riyanto and Nurul Hidayati

AIP Conference Proceedings **2114**, 020004 (2019); <https://doi.org/10.1063/1.5112388>

SHOW ABSTRACT



 Free . June 2019

## **Mixed method in acoustic comfort measurement to reveal component of acoustics preservation**


Nur Rahmawati Syamsiyah, Atyanto Dharoko and Sentagi Sesotya Utami

AIP Conference Proceedings **2114**, 020005 (2019); <https://doi.org/10.1063/1.5112389>



BROWSE VOLUMES




[SHOW ABSTRACT](#) Free . June 2019

## **Design of kaffir lime peel extract tablets by direct compression: Effects of filler-binder on rheological properties**

Wenny Irawaty, Lannie Hadisoewignyo, Jenifer Wijaya, Shindy Saera Sababalat and Andy Sebastian Tanjaya


AIP Conference Proceedings **2114**, 020006 (2019); <https://doi.org/10.1063/1.5112390>

[SHOW ABSTRACT](#) Free . June 2019

## **Digital automatic livestock weighing system using single beam load cell**

Novy Hapsari, Tris Dewi Indraswati, Mohamad Haifan and Denny Maulana

AIP Conference Proceedings **2114**, 020007 (2019); <https://doi.org/10.1063/1.5112391>


[SHOW ABSTRACT](#) Free . June 2019

## **Pin-fin shape and orientation effects on wall heat transfer predictions of gas turbine blade**

Marwan Effendy, Yufeng Yao, Jun Yao and Denis R. Marchant

AIP Conference Proceedings **2114**, 020008 (2019); <https://doi.org/10.1063/1.5112392>


[BROWSE VOLUMES](#)

[SHOW ABSTRACT](#) Free . June 2019

## **An example of a digital product design in Russian industry**

Elizaveta Gromova


AIP Conference Proceedings **2114**, 020009 (2019); <https://doi.org/10.1063/1.5112393>

[SHOW ABSTRACT](#) Free . June 2019

## ***Borassus flabellifer* L. waste for Kraft paper production with Kraft methods**

Azmi Alvian Gabriel and Yunita Siti Mardhiyyah

AIP Conference Proceedings **2114**, 020010 (2019); <https://doi.org/10.1063/1.5112394>


[SHOW ABSTRACT](#) Free . June 2019

## **Chitosan modified mesoporous silica nanoparticles as a versatile drug carrier with pH dependent properties**

Angela Vionna Santoso, Alex Susanto, Wenny Irawaty, Lannie Hadisoewignyo and Sandy Budi Hartono

AIP Conference Proceedings **2114**, 020011 (2019); <https://doi.org/10.1063/1.5112395>

[BROWSE VOLUMES](#)

 Free . June 2019


## **Multi objective optimization of vulcanization process parameters for reducing quality loss cost based on BPNN-PSO method**

Hardimuko Seto Aji, Bobby Oedy Pramoedyo Soepangkat, Budi Santosa and Rachmadi Norcahyo

AIP Conference Proceedings **2114**, 020012 (2019); <https://doi.org/10.1063/1.5112396>

SHOW ABSTRACT



 Free . June 2019


## **Effect of cooling in the injection molding process of acetabular cup of hip joint prosthesis**

Agung Setyo Darmawan, Bambang Waluyo Febriantoko, Pramuko Ilmu Purboputro, Masyrukan, Abdul Hamid and Alfian Amri

AIP Conference Proceedings **2114**, 020013 (2019); <https://doi.org/10.1063/1.5112397>

SHOW ABSTRACT



 Free . June 2019

## **Determination of optimum vulcanization process parameters using Taguchi GRA for reducing quality loss cost**


Fajar Alam Yudha, Bobby Oedy Pramoedyo Soepangkat, Vita Ratnasari, Mokhammad Suef and Rachmadi Norcahyo



BROWSE VOLUMES

SHOW ABSTRACT



 Free . June 2019


## Comparative studies of coffee processing methods for decision making in appropriate technology implementation

Mirwan Ardiansyah Karim, Febtri Wijayanti and Arie Sudaryanto

AIP Conference Proceedings 2114, 020015 (2019); <https://doi.org/10.1063/1.5112399>

SHOW ABSTRACT



 Free . June 2019


## Optimization of centrifugal pump performance with various blade number

Subroto and Marwan Effendy

AIP Conference Proceedings 2114, 020016 (2019); <https://doi.org/10.1063/1.5112400>

SHOW ABSTRACT



 Free . June 2019


## Vehicle routing problem model and simulation with probabilistic demand and sequential insertion

Ary Arvianto, Singgih Saptadi, Wiwik Budiawan and Rizal Luthfi Nartadhi

AIP Conference Proceedings 2114, 020017 (2019); <https://doi.org/10.1063/1.5112401>




BROWSE VOLUMES

[SHOW ABSTRACT](#) Free . June 2019

## **The effect of 5% ethanol in 88, 92, and 98 RON gasoline on motorcycle engine performance**

Fransiskus Adian, Bambang Sugiarto, Cahyo Setyo Wibowo, Ardi Zikra and Try Mulya


AIP Conference Proceedings **2114**, 020018 (2019); <https://doi.org/10.1063/1.5112402>

[SHOW ABSTRACT](#) Free . June 2019

## **Acid hidrolisis of used paper using microwave as heating**

Ahmad M. Fuadi, Muhammad Mujiburohman, Rois Fatoni, Yosi Adhi Chaniago and Aulia Santiago

AIP Conference Proceedings **2114**, 020019 (2019); <https://doi.org/10.1063/1.5112403>

[SHOW ABSTRACT](#) Free . June 2019


## **Environmentally friendly smart electric stove design**

Hasyim Asyari, Bana Handaga and Sigit Kamseno

AIP Conference Proceedings **2114**, 020020 (2019); <https://doi.org/10.1063/1.5112404>

[SHOW ABSTRACT](#)[BROWSE VOLUMES](#)

# PRODUCT DESIGN, MATERIAL ENGINEERING, BUILDING ENGINEERING AND MANAGEMENT

 Free . June 2019


## Extraction of Siwalan oil (*Borassus flabellifer L.*) by different methods

Azmi Alvian Gabriel, Nurul Fadhillah Achmad and Desy Rahmawati

AIP Conference Proceedings 2114, 030001 (2019); <https://doi.org/10.1063/1.5112405>

SHOW ABSTRACT



 Free . June 2019


## The influence of behavioral prediction factors and intention in improving 3R (reduce, reuse, recycle) household behavior in Tanjung Mas, Semarang, Indonesia

Novie Susanto, Lyra Davidesyta, Denny Nurkertamanda and Thomas Triadi Putranto

AIP Conference Proceedings 2114, 030002 (2019); <https://doi.org/10.1063/1.5112406>

SHOW ABSTRACT



 Free . June 2019

## Improving quality for plate assembly of drum brake using six sigma method

Dyah Ika Rinawati, Anggitta Realiza Andini and Diana Puspita Sari


AIP Conference Proceedings 2114, 030003 (2019); <https://doi.org/10.1063/1.5112407>



BROWSE VOLUMES

SHOW ABSTRACT



 Free . June 2019


## **Analog rice characteristics made from sago flour and arrowroot flour in supporting food diversification**

Isti Pudjihastuti, Siswo Sumardiono, Edy Supriyo and Heny Kusumayanti

AIP Conference Proceedings 2114, 030004 (2019); <https://doi.org/10.1063/1.5112408>

SHOW ABSTRACT



 Free . June 2019


## **Effects of bifilm on the response of artificial aging of aluminium alloy ADC12**

Bernard Noventio Sutrisno and Helena Carolina Kis Agustin

AIP Conference Proceedings 2114, 030005 (2019); <https://doi.org/10.1063/1.5112409>

SHOW ABSTRACT




 Free . June 2019

## **Production scheduling of bar mill using the combination of particle swarm optimization and Nawaz enscore ham for minimizing makespan in steel company**

Yusraini Muharni, Evi Febianti, Hanifa and Arlianur




BROWSE VOLUMES

[SHOW ABSTRACT](#) Free . June 2019

## **Material tracking system of the supply chain in engineering procurement construction (EPC)**

Shifa Fauziyah, Moh Nur Sholeh, Budhi Dharmo, Parhimpunan Purba and Sutanto


AIP Conference Proceedings 2114, 030007 (2019); <https://doi.org/10.1063/1.5112411>

[SHOW ABSTRACT](#) Free . June 2019

## **Design automation control of downtime recording machine in manufacturing industry**

Afianto, Dzaki Rif'at Abdullah and Syahril Ardi

AIP Conference Proceedings 2114, 030008 (2019); <https://doi.org/10.1063/1.5112412>

[SHOW ABSTRACT](#) Free . June 2019

## **Post shrinkage comparison of plastic injection products by using solid mold, laminated steel tooling mold, and soft tooling mold**


Bambang Waluyo Febriantoko, Agung Setyo Darmawan, Masyrukan and Abdul Hamid

[BROWSE VOLUMES](#)



SHOW ABSTRACT



 Free . June 2019


## Adoption of DoD HFACS for medication error analysis

Indryati Sunaryo, Gilar Sundara and Ari Widyanti

AIP Conference Proceedings 2114, 030010 (2019); <https://doi.org/10.1063/1.5112414>

SHOW ABSTRACT



 Free . June 2019

## Advanced nanoemulsion production on ginger (*Zingiber officinale*) for product quality improvement

Mohammad Endy Yulianto, Anggun Puspitarini Siswanto, Dwi Handayani, Fransisca Sari Nugraheni, Indah Hartati and Yusuf Arya Yudanto

AIP Conference Proceedings 2114, 030011 (2019); <https://doi.org/10.1063/1.5112415>

SHOW ABSTRACT



 Free . June 2019

## Multi response prediction of cutting force and delamination in carbon fiber reinforced polymer using backpropagation neural network-genetic algorithm

Fathi Robbany, Bambang Pramujati, Suhardjono, Mohammad Khoirul Effendi, Bobby Oedy Pramoedvo Soebanekat and Rachmadi Norcahvo




BROWSE VOLUMES

AIP Conference Proceedings **2114**, 030012 (2019); <https://doi.org/10.1063/1.5112416>

SHOW ABSTRACT



 Free . June 2019


## **Multi response prediction of end-milling CFRP with backpropagation neural network**

Fajar Perdana Nurullah, Bambang Pramujati, Suhardjono, Mohammad Khoirul Effendi, Bobby Oedy Pramodyo Soepangkat and Rachmadi Norcahyo

AIP Conference Proceedings **2114**, 030013 (2019); <https://doi.org/10.1063/1.5112417>

SHOW ABSTRACT



 Free . June 2019


## **Influence of amount of reclaimed asphalt pavement and asphalt using warm mix asphalt method on asphalt concrete wearing course**

Winas Maulidani Susanto, Raden Jachrizal Sumabrata, Sigit Pranowo Hadiwardoyo and Restu Alan Suyuti

AIP Conference Proceedings **2114**, 030014 (2019); <https://doi.org/10.1063/1.5112418>

SHOW ABSTRACT



 Free . June 2019

BROWSE VOLUMES


## The influence of product design on environmental impacts using life cycle assessment

Heru Prastawa and Sri Hartini

AIP Conference Proceedings 2114, 030015 (2019); <https://doi.org/10.1063/1.5112419>

SHOW ABSTRACT



 Free . June 2019


## Overlay maintenance on road heavy vehicle lane by non-destructive test method

Dadang Iskandar, Sigit Pranowo Hadiwardoyo, Raden Jachrizal Sumabrata and Hendra Ariyapijati

AIP Conference Proceedings 2114, 030016 (2019); <https://doi.org/10.1063/1.5112420>

SHOW ABSTRACT



 Free . June 2019

## Mechanical property of straw concrete brick with additives viscocrete

Ilham Bahari, Sri Sumarni and Eko Supri Murtiono

AIP Conference Proceedings 2114, 030017 (2019); <https://doi.org/10.1063/1.5112421>

SHOW ABSTRACT



BROWSE VOLUMES


## **The minimum water curing recovery time after burning of aluminium fiber light weight concrete (with *a/wa* as coarse aggregate) modulus elasticity**

Antonius Mediyanto, Endah Safitri, Wibowo and Johannes Berchman Irawan Sunu Widagdo

AIP Conference Proceedings 2114, 030018 (2019); <https://doi.org/10.1063/1.5112422>

SHOW ABSTRACT



 Free . June 2019


## **The connection model of segmental precast concrete beam reinforced with recycled tyre**

Agus Maryoto, Nor Intang Setyo Hermanto and Gathot Heri Sudibyo

AIP Conference Proceedings 2114, 030019 (2019); <https://doi.org/10.1063/1.5112423>

SHOW ABSTRACT



 Free . June 2019

## **Effect of volume fraction and aspect ratio of Agave fiber *Cantula Roxb* against compressive strength and direct tensile strength**


Edy Purwanto, Stefanus Adi Kristiawan, Endah Safitri and Febiana Yoda Kartika

AIP Conference Proceedings 2114, 030020 (2019); <https://doi.org/10.1063/1.5112424>

SHOW ABSTRACT



BROWSE VOLUMES

 Free . June 2019


## **Springback phenomenon analysis of tailor welded blank of mild steel in U-bending process**

Agung Setyo Darmawan, Agus Dwi Anggono and Shodiq Nugroho

AIP Conference Proceedings **2114**, 030021 (2019); <https://doi.org/10.1063/1.5112425>

SHOW ABSTRACT



 Free . June 2019


## **High content Styrofoam as partial substitution for fine aggregate in SCC lightweight concrete brick**

Mochamad Solikin, Redy Widiyanto, Ali Asroni, Budi Setiawan and Muhammad Noor Asnan

AIP Conference Proceedings **2114**, 030022 (2019); <https://doi.org/10.1063/1.5112426>

SHOW ABSTRACT



 Free . June 2019

## **Kolb's experiential learning for vocational education in mechanical engineering: A review**


Stephanus Fajar Pamungkas, Indah Widiastuti and Suharno

AIP Conference Proceedings **2114**, 030023 (2019); <https://doi.org/10.1063/1.5112427>

SHOW ABSTRACT



BROWSE VOLUMES

 Free . June 2019


## **Life cycle – Value stream mapping: Evaluating sustainability using lean manufacturing tools in the life cycle perspective**

Sri Hartini, Udisubakti Ciptomulyono and Maria Anityasari

AIP Conference Proceedings 2114, 030024 (2019); <https://doi.org/10.1063/1.5112428>

SHOW ABSTRACT



 Free . June 2019

## **The effect of NaCl concentration and process time in continuous electrooxidation technique for degradation of textile dyestuffs**


Suseno, Sajidan, Mohammad Masykuri and Prabang Setyono

AIP Conference Proceedings 2114, 030025 (2019); <https://doi.org/10.1063/1.5112429>

SHOW ABSTRACT



## **SUSTAINABLE INFRASTRUCTURE AND BUILT ENVIRONMENT**

 Free . June 2019

## **Flexural behaviour of reinforced lightweight concrete floor panel using hot water pre-treated oil palm shell as coarse aggregate**

Ayudia Mutiara Fani, Nuraziz Handika, Elly Tjahjono and Essy Arijoeni


AIP Conference Proceedings 2114, 040001 (2019); <https://doi.org/10.1063/1.5112430>



BROWSE VOLUMES

SHOW ABSTRACT



 Free . June 2019


## **The use of reclaimed asphalt pavement by adding retona asbuton on asphalt concrete wearing course using the warm mix asphalt method**

Restu Alan Suyuti, Raden Jachrizal Sumabrata, Sigit Pranowo Hadiwardoyo and Dadang Iskandar

AIP Conference Proceedings 2114, 040002 (2019); <https://doi.org/10.1063/1.5112431>

SHOW ABSTRACT



 Free . June 2019


## **Sensitivity test of IHCM 1997 traffic signal timings using TRANSYT program and VISSIM**

Budi Yulianto

AIP Conference Proceedings 2114, 040003 (2019); <https://doi.org/10.1063/1.5112432>

SHOW ABSTRACT



 Free . June 2019

## **Durability and stiffness prediction value of asphalt concrete-binder course using Parangtritis sea sand**

Agus Riyanto and Wahyu Setyawan




BROWSE VOLUMES

AIP Conference Proceedings **2114**, 040004 (2019); <https://doi.org/10.1063/1.5112433>

SHOW ABSTRACT



 Free . June 2019


## Improvement of wear resistant of railway wheel by using graphite in various speeds based on disc-on-disc contact system

Junaidi, Joko Suparno, Dimas Halim Ardiansyah, Marwan Effendy and Jamari

AIP Conference Proceedings **2114**, 040005 (2019); <https://doi.org/10.1063/1.5112434>

SHOW ABSTRACT



 Free . June 2019


## Adopting open source concept and incremental housing as self-planning housing for low-income community

Ahmad Azis Mulyono and Rini Hidayati

AIP Conference Proceedings **2114**, 040006 (2019); <https://doi.org/10.1063/1.5112435>

SHOW ABSTRACT



 Free . June 2019

## Optimization of infrastructure planning on waste management

in Sragen by using linear programming model



BROWSE VOLUMES




Albert Pramono Soesanto, Mochammad Solikin, Purwanti Sri Pudyastuti and Nurul Hidayati

AIP Conference Proceedings **2114**, 040007 (2019); <https://doi.org/10.1063/1.5112436>

SHOW ABSTRACT



 Free . June 2019


## Modal choice analysis between cycling and walking of tourist areas in Surakarta

Dewi Handayani, Susi Purwaningsih and Amirotul Musthofiah Hidayah Mahmudah

AIP Conference Proceedings **2114**, 040008 (2019); <https://doi.org/10.1063/1.5112437>

SHOW ABSTRACT



 Free . June 2019


## Anticipation of solar radiation through the building C envelope of campus a Universitas Trisakti

Lili Kusumawati Machdijar, Erni Setyowati and Agus Budi Purnomo

AIP Conference Proceedings **2114**, 040009 (2019); <https://doi.org/10.1063/1.5112438>

SHOW ABSTRACT



 Free . June 2019

## Land tenure system and utilization of *Bengkok* land in Indrokilo sub-village. Lerep Village. Semarang Regency




BROWSE VOLUMES

AIP Conference Proceedings **2114**, 040010 (2019); <https://doi.org/10.1063/1.5112439>

SHOW ABSTRACT



 Free . June 2019


## **Different impact of side friction condition on traffic flow along Yosodipuro Street Surakarta**

Nurul Hidayati, Sri Sunarjono, Saud Amjad Awad and Alfia Magfirona

AIP Conference Proceedings **2114**, 040011 (2019); <https://doi.org/10.1063/1.5112440>

SHOW ABSTRACT



 Free . June 2019


## **Skid resistance performance against temperature change of hot-mix recycled asphalt pavement with added crumb rubber**

Audy Dwi Putra, Sigit Pranowo Hadiwardoyo and Raden Jachrizal Sumabrata

AIP Conference Proceedings **2114**, 040012 (2019); <https://doi.org/10.1063/1.5112441>

SHOW ABSTRACT



 Free . June 2019

## **Rutting deformation of gap-graded hot-mix asphalt with added of waste tire rubber**

Lailv Kartika, Sigit Pranowo Hadiwardoyo and Raden Jachrizal Sumabrata




[BROWSE VOLUMES](#)

AIP Conference Proceedings 2114, 040013 (2019); <https://doi.org/10.1063/1.5112442>

SHOW ABSTRACT



 Free . June 2019


## Portable machine to machine system for monitoring temperature and flammable gas of outdoor environment

Heru Supriyono, Eko Didik Febriyanto and Kun Harismah

AIP Conference Proceedings 2114, 040014 (2019); <https://doi.org/10.1063/1.5112443>

SHOW ABSTRACT



 Free . June 2019

## Micro and mezzo space pattern in Kampung Kauman Solo

Widyastuti Nurjayanti

AIP Conference Proceedings 2114, 040015 (2019); <https://doi.org/10.1063/1.5112444>

SHOW ABSTRACT



# PRESERVATION, CONSERVATION AND WATER MANAGEMENT



Free . June 2019

BROWSE VOLUMES


## Visual assessment deterioration analysis of runways at Sultan Aji Muhammad Sulaiman Sepinggan Airport Balikpapan

Yanti, Sri Sunarjono, Agus Riyanto, Nurul Hidayati and Alfia Magfirona

AIP Conference Proceedings 2114, 050001 (2019); <https://doi.org/10.1063/1.5112445>

SHOW ABSTRACT



 Free . June 2019


## Thermal condition of Semarang heritage Tawang railways station

Hana Faza Surya Rusyda, Erni Setyowati and Gagoek Hardiman

AIP Conference Proceedings 2114, 050002 (2019); <https://doi.org/10.1063/1.5112446>

SHOW ABSTRACT



 Free . June 2019

## Compatibility of thorn pandanus (*Pandanus tectorius*) leaf fiber with ethanol solution treatment on polyester resin

Sri Mulyo Bondan Respati, Helmy Purwanto and Afif Rifqi

AIP Conference Proceedings 2114, 050003 (2019); <https://doi.org/10.1063/1.5112447>

SHOW ABSTRACT



 Free . June 2019

BROWSE VOLUMES


## The effect of roof tiles materials on roof truss construction and room temperature

Budi Priyanto and Romi Nur Hafittuloh

AIP Conference Proceedings 2114, 050004 (2019); <https://doi.org/10.1063/1.5112448>

SHOW ABSTRACT



 Free . June 2019


## Settlement analysis on circle footing foundation reinforced by concrete waste above red brick dust column

Anto Budi Listyawan and Finisha Haedara

AIP Conference Proceedings 2114, 050005 (2019); <https://doi.org/10.1063/1.5112449>

SHOW ABSTRACT



 Free . June 2019

## Tensile strength, personal frequency and stiffness in the treatment of agave and bamboo fiber composite

Ilyas Renreng, Hammada, Mohammad Adnan and Nur Wahyuni

AIP Conference Proceedings 2114, 050006 (2019); <https://doi.org/10.1063/1.5112450>

SHOW ABSTRACT



 Free . June 2019

BROWSE VOLUMES


## Optimization of waterway element on CBL inland waterway transportation mode

Mohammed Ali Berawi, Ulfa Mutaharah, Gunawan and Perdana Miraj

AIP Conference Proceedings 2114, 050007 (2019); <https://doi.org/10.1063/1.5112451>

SHOW ABSTRACT



 Free . June 2019


## Influence of the number of blade in hydro microturbine due to flow velocity

Wijianto, Hadi Wiranata Rachman, Supriyono and Muamaroh

AIP Conference Proceedings 2114, 050008 (2019); <https://doi.org/10.1063/1.5112452>

SHOW ABSTRACT



 Free . June 2019

## Effect of lateral and longitudinal distance of baffled block on flow velocity for various tail water depth conditions

Desyta Ulfiana and Wasis Wardoyo

AIP Conference Proceedings 2114, 050009 (2019); <https://doi.org/10.1063/1.5112453>

SHOW ABSTRACT



Free . June 2019

BROWSE VOLUMES


## Can we adapt to tidal flooding?

Raden Rara Maria Immaculata Retno Susilorini, Desiana Vidayanti, Helmia Adita Fitra and Budi Santosa

AIP Conference Proceedings 2114, 050010 (2019); <https://doi.org/10.1063/1.5112454>

SHOW ABSTRACT



 Free . June 2019


## Pretreatment of endek wastewater with ozone/hydrogen peroxide to improve biodegradability

I. Wayan Koko Suryawan, Anshah Silmi Afifah and Gita Prajati

AIP Conference Proceedings 2114, 050011 (2019); <https://doi.org/10.1063/1.5112455>

SHOW ABSTRACT



 Free . June 2019


## Study on infiltration capacity at disaster-prone areas in Krasak's watershed of Mount Merapi, Indonesia

Jazaul Ikhsan, Deden Hendrawan and Puji Harsanto

AIP Conference Proceedings 2114, 050012 (2019); <https://doi.org/10.1063/1.5112456>

SHOW ABSTRACT



 Free . June 2019

BROWSE VOLUMES


## Structural behavior of precast concrete wall panels due to dynamic load: A review

Muhammad Ujianto, Ahmad Zurisman Mohd Ali and Mochamad Solikin

AIP Conference Proceedings 2114, 050013 (2019); <https://doi.org/10.1063/1.5112457>

SHOW ABSTRACT



 Free . June 2019


## Impact of instant-controlled pressure drop treatment on thermal properties and microbial decontamination of banana flour

Puguh Setyopratomo, Akbarningrum Fatmawati, Emma Savitri, Putu Doddy Sutrisna and Karim Allaf

AIP Conference Proceedings 2114, 050014 (2019); <https://doi.org/10.1063/1.5112458>

SHOW ABSTRACT



 Free . June 2019

## Assessment of building energy performance in vocational high school building for lighting and thermal comfort: A review of two regions

Imam Alfianto, Mohammad Sulton, Astri Anindya Sari and Nindyawati


AIP Conference Proceedings 2114, 050015 (2019); <https://doi.org/10.1063/1.5112459>

SHOW ABSTRACT



BROWSE VOLUMES



 Free . June 2019


## **The effects of pineapple juice multistage evaporation on the freezing rate of frozen pineapple brownie cake**

Nur Istianah, Tanalyana Hasna and Elok Waziroh

AIP Conference Proceedings **2114**, 050016 (2019); <https://doi.org/10.1063/1.5112460>

SHOW ABSTRACT



 Free . June 2019


## **Numerical analysis of stress and displacement on the index finger of the prosthetic hand due to hook position**

Gilar Pandu Annanto, Rifky Ismail, Ismoyo Haryanto, Mochammad Ariyanto, Kharisma Agung Pambudi and Kirana Astari Pranoto

AIP Conference Proceedings **2114**, 050017 (2019); <https://doi.org/10.1063/1.5112461>

SHOW ABSTRACT



 Free . June 2019

## **Pre-evaluation of Kedung Ombo Dam safety based on probabilistic seismic hazard analysis**


Yusep Muslih Purwana, Raden Harya Dananjaya and Wahyu Aryo Hartono

AIP Conference Proceedings **2114**, 050018 (2019); <https://doi.org/10.1063/1.5112462>

SHOW ABSTRACT



BROWSE VOLUMES

 Free . June 2019


## **Pyrolysis of polypropylene waste with natural zeolite as catalyst**

Emi Erawati, Hamid and Resti Dian Permatasari

AIP Conference Proceedings **2114**, 050019 (2019); <https://doi.org/10.1063/1.5112463>

SHOW ABSTRACT



 Free . June 2019


## **Effect of adding SiC on resistance wear and hardness through stir casting of aluminum matrix composites**

Nur Wahyuni, Rusdi Nur, Ilyas Renreng and Mohammad Adnan

AIP Conference Proceedings **2114**, 050020 (2019); <https://doi.org/10.1063/1.5112464>

SHOW ABSTRACT



 Free . June 2019

## **Analysis voltage drop and alternative network maneuvers in BRG-4 recovery PT. PLN (Persero) Salatiga service unit using etap power station 12.6**


Umar and Naufal Afif Murtadho

AIP Conference Proceedings **2114**, 050021 (2019); <https://doi.org/10.1063/1.5112465>

SHOW ABSTRACT



BROWSE VOLUMES

 Free . June 2019


## **Tuff as rock and soil: Review of the literature on tuff geotechnical, chemical and mineralogical properties around the world and in Indonesia**

Novi Asniar, Yusep Muslih Purwana and Niken Silmi Surjandari

AIP Conference Proceedings **2114**, 050022 (2019); <https://doi.org/10.1063/1.5112466>

SHOW ABSTRACT



 Free . June 2019


## **Bottom and fly ash treatment of medical waste incinerator from community health centres with solidification/stabilization**

I. Wayan Koko Suryawan, Gita Prajati and Anshah Silmi Afifah

AIP Conference Proceedings **2114**, 050023 (2019); <https://doi.org/10.1063/1.5112467>

SHOW ABSTRACT



 Free . June 2019

## **Resilient modulus of hot-mix recycled asphalt pavement with waste from engine oil and vehicle tires**


Fahmi Fajriansyah, Sigit Pranowo Hadiwardoyo and Raden Jachrizal Sumabrata

AIP Conference Proceedings **2114**, 050024 (2019); <https://doi.org/10.1063/1.5112468>

SHOW ABSTRACT



BROWSE VOLUMES

 Free . June 2019


## **The comparison of acoustical properties of seashell and natural fiber composites for architectural acoustics**

Erni Setyowati, Gagoek Hardiman and Purwanto

AIP Conference Proceedings **2114**, 050025 (2019); <https://doi.org/10.1063/1.5112469>

SHOW ABSTRACT



 Free . June 2019

## **Natural dye extraction from tropical almond (*Terminalia catappa* Linn) leaves and its characterization**


Herry Purnama, Winya Eriani and Nur Hidayati

AIP Conference Proceedings **2114**, 050026 (2019); <https://doi.org/10.1063/1.5112470>

SHOW ABSTRACT



## **GREEN ENERGY AND COMPUTING**

 Free . June 2019


## **An integrated M-S-QUAL and importance-performance analysis approach for assessing service quality of mobile commerce application**

Muhammad Mujiya Ulkhaq, Abel Kristanto Widodo, Widhiyaningrum, Muhammad Faisal Afa Yulianto and Maria Olivia Gracia

AIP Conference Proceedings **2114**, 060001 (2019); <https://doi.org/10.1063/1.5112472>




BROWSE VOLUMES

[SHOW ABSTRACT](#) Free . June 2019

## Priority for improvement of mobile banking services using Kano model and QFD

Imam Safi'i, Yudiarto Perdana Putra and Pamadya Vitasgoro


AIP Conference Proceedings **2114**, 060002 (2019); <https://doi.org/10.1063/1.5112473>

[SHOW ABSTRACT](#) Free . June 2019

## Behavioral patterns of vocational students in Lego Mindstorm: A literature review

Regina Nur Fitriyaningsih, Cucuk Wawan Budiyanto and Rosihan Ari Yuana

AIP Conference Proceedings **2114**, 060003 (2019); <https://doi.org/10.1063/1.5112474>


[SHOW ABSTRACT](#) Free . June 2019

## Coconut shell breaker machine

Yuliati, Hadi Santosa and Ignatius Jaka Mulyana

AIP Conference Proceedings **2114**, 060004 (2019); <https://doi.org/10.1063/1.5112475>

[SHOW ABSTRACT](#)[BROWSE VOLUMES](#)

 Free . June 2019


## **Minimization of the hole entry and hole exit delamination on drilling process of carbon fiber reinforced polymer using BPNN-PSO**

Rachmadi Norcahyo, Bobby Oedy Pramoedyo Soepangkat and Mohammad Khoirul Effendi

AIP Conference Proceedings 2114, 060005 (2019); <https://doi.org/10.1063/1.5112476>

SHOW ABSTRACT



 Free . June 2019


## **Effect of acidity level of substrate by lime water and acetic acid addition on biogas production**

Hendry Sakke Tira, Yesung Allo Padang and Supriadi

AIP Conference Proceedings 2114, 060006 (2019); <https://doi.org/10.1063/1.5112477>

SHOW ABSTRACT




 Free . June 2019

## **Effect of biogas addition on particulate matter emission at idle operating mode in diesel engine**


Hendry Sakke Tira

AIP Conference Proceedings 2114, 060007 (2019); <https://doi.org/10.1063/1.5112478>

 SHOW ABSTRACT



BROWSE VOLUMES

 Free . June 2019


## **Characterization of sPEEK/chitosan membrane for the direct methanol fuel cell**

Nur Hidayati, Tri Harmoko, Muhammad Mujiburohman and Herry Purnama

AIP Conference Proceedings **2114**, 060008 (2019); <https://doi.org/10.1063/1.5112479>

SHOW ABSTRACT



 Free . June 2019


## **Augmented reality based learning media for virtual instruction of LPG cylinder assembly**

Arief Rahman and Rahmatul Istighfarin

AIP Conference Proceedings **2114**, 060009 (2019); <https://doi.org/10.1063/1.5112480>

SHOW ABSTRACT



 Free . June 2019

## **Hybrid model of ARIMA-linear trend model for tourist arrivals prediction model in Surakarta City, Indonesia**


Purwanto, Sunardi, Fenty Trisanti Julfia and Aditya Paramananda

AIP Conference Proceedings **2114**, 060010 (2019); <https://doi.org/10.1063/1.5112481>

SHOW ABSTRACT



BROWSE VOLUMES

 Free . June 2019


## Performance measurement on lease equipment with overall equipment effectiveness

Ade Supriatna, Moses Laksono Singgih, Erwin Widodo and Nani Kurniati

AIP Conference Proceedings 2114, 060011 (2019); <https://doi.org/10.1063/1.5112482>

SHOW ABSTRACT



 Free . June 2019


## Clustering tuberculosis in children using K-Means based on geographic information system

Ratih Sari Wardani, Purwanto, Sayono and Aditya Paramananda

AIP Conference Proceedings 2114, 060012 (2019); <https://doi.org/10.1063/1.5112483>

SHOW ABSTRACT



 Free . June 2019

## Modal choice between bicycle and pedicab using stated preference method in Benteng Vastenburg and Keraton Surakarta

Dewi Handayani, Shofi Nur Inayati and Amirotul Musthofiah Hidayah Mahmudah

AIP Conference Proceedings 2114, 060013 (2019); <https://doi.org/10.1063/1.5112484>

SHOW ABSTRACT



BROWSE VOLUMES



## Resources

[AUTHOR](#)

[LIBRARIAN](#)

[ADVERTISER](#)

---

## General Information

[ABOUT](#)

[CONTACT](#)

[HELP](#)

[PRIVACY POLICY](#)

[TERMS OF USE](#)

FOLLOW AIP PUBLISHING:



Website © 2021 AIP Publishing LLC.

Article copyright remains as specified within the article.

**Scitation**



[BROWSE VOLUMES](#)