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PROCEEDINGS OF THE 8th ANNUAL BASIC SC INTERNATIONAL CONFERENCE

6-7 March 2018
Ijen Suites Hotel Resort & Convention
Malang, Indonesia

**Convergence of Basic Sciences,
Toward the World's Sustainability Challenges**

Topics

Energy
Environmental Science and Technology

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The Proceedings Book of The 8th Annual Basic Science International Conference 2018



The 8th Annual Basic Science International Conference
Convergence of Basic Sciences, Toward the World's Sustainability Challenges

6 -7 March 2018

Ijen Suites Resorts & Convention

Malang, East Java Indonesia

Proceedings Book

Topics:

1. Energy
2. Environmental Science and Technology
3. Instrumentation and Measurement
4. Material Science and Technology
5. Mathematics, Statistics, and Modelling
6. Molecular and Health Science
7. Science and Technology Education

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About BaSIC

The Annual Basic Science International Conference (BaSIC) is an annual scientific meeting organized by Faculty of Science, Brawijaya University, Indonesia. This meeting aimed to promote mutual exchange between scientists and also experts, to discuss innovative ideas in scientific research, and to tackle contemporary problems through the application of knowledge that rise from science. The scope of this conference is fundamental and applied research in chemistry, biology, physics, and mathematics. The origin of this conference was initiated in year 2000, by the Faculty of Science of Brawijaya University, under the name of Seminar Nasional Kemipaan (National Science Conference). Since then, the conference has been organized regularly on annual basis. In 2004, the conference changed its name to Basic Science Seminar (BSS) and started to invite international speakers and participants. The conference then expands its scope to international in 2011 and formally adopting the current name. The last Annual Basic Science International Conference was organized successfully on March 7-8th, 2017 at Ijen Suites Hotel Resort and Convention, Malang with participants from many countries including Australia, Switzerland, Japan, and Germany.

Currently, the 8th Annual Basic Science International Conference 2018 (8th BaSIC 2018) has been held on March 6-7th, 2018 at Ijen Suites Hotel Resort and Convention, Malang. The recent theme of the 8th BaSIC was “Convergence of Basic Sciences, toward World’s Sustainability Challenges” which covered broad range of basic science research. This particular theme was intended to promote convergence science as a transformative trend to address the global challenges, such as ensuring energy, health, water resources and food security in a sustainable world. This international forum also provided a platform where national and international academia or researchers, policy makers, and other stakeholders to translate technology, exchange ideas, and help stimulate multidisciplinary international collaborations in a convergent-manner for shaping a worldwide sustainable development. It was worth noting that, the 8th BaSIC event genuinely highlights the important of convergence of basic science research to address world’s sustainability challenges.

Objectives

- To gain insights on current trends in basic science research and education, such as the contribution of interdisciplinary approaches to solve
- To enhance multidisciplinary collaborations among scientists and relevant stakeholders in a convergent-manner for shaping a worldwide sustainable development

Welcome Message from the Dean of Mathematics and Natural Sciences

Assalamu'alaikum warohmatulloohi wabarokaatuh

On behalf of the Dean of Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, I would like to extend my warmest welcome to all delegates from all over the world. Welcome to Malang, where Malang is one of the educational city in Indonesia. There are about 40 Universities in Malang, States and Privates. One of it is Universitas Brawijaya, the top ten University in Indonesia. Malang, which is about more than 400 meters above sea level, has many tourist destinations, highlands, mountains, some natural beaches, and other. Malang is like a bowl, surrounded by some volcanoes in the east (Semeru and Bromo), west (Kawi and Kelud) and north (Arjuna and Welirang Complex), and in the south are coastal areas, where we have many beautiful new opening beaches.

We are very pleased to welcome you in the proceedings book of the 8th Annual Basic Sciences International Conference 2018. This proceedings is one of the continuations for the conference. Based on these papers, hopefully, more collaborations can be initiated or should be followed up between us. I would like to express my gratitude to all of the participants, keynote and invited speakers as well. Many thanks also go to the reviewers and the editorial team for their big effort in supporting this proceedings book. Last but not least, my big appreciation to the steering and organizing committees, in realizing this proceedings book.

Thank you

Wassalamu 'alaikum wr wb.

Adi Susilo, P.hD

Dean Faculty of Mathematics and Natural Sciences,

Welcome Message from the Chairman of BaSIC 2018

On behalf of the organizing committee, it is a great pleasure to welcome all the participants, delegates and keynote speakers to the 8th Basic Science International Conference (BaSIC) 2018 at the Ijen Suites Hotel Resort and Convention in Malang, Indonesia. Taking place every year, the theme of this year's conference is "Convergence of Basic Science, toward World's Sustainability Challenges" which covers broad range of basic science research.

This particular theme is intended to promote convergence science as a transformative trend to address the global challenges, such as ensuring energy, health, water resources and food security in a sustainable world. This international forum also provides a platform where national and international academia or researchers, policy makers, and other stakeholders to translate technology, exchange ideas, and help stimulate multidisciplinary international collaborations in a convergent-manner for shaping a worldwide sustainable development. It is worth noting that, the 8th BaSIC event genuinely highlights the important of convergence of basic science research to address world's sustainability challenges.

This conference has been participated by almost 500 participants. The conference scientific board has accepted 380 papers to be presented either oral or poster presentation. The organising committee is gratified to have a total of 89 full-papers submitted to this proceedings book either from students (bachelor and postgraduates), academic staff (lecturers) or researchers. We would like to acknowledge the terrific support of proceedings editorial team and reviewers in managing this proceedings book. We also would like to thank all participants who present their academic works in the 8th BaSIC 2018, and especially to our distinguished keynote and invited speakers for their collaboration and contribution for the success of the 8th BaSIC 2018.

Sincerely,

Yoga Dwi Jatmiko, M.App.Sc., Ph.D
Chairman of BaSIC 2018

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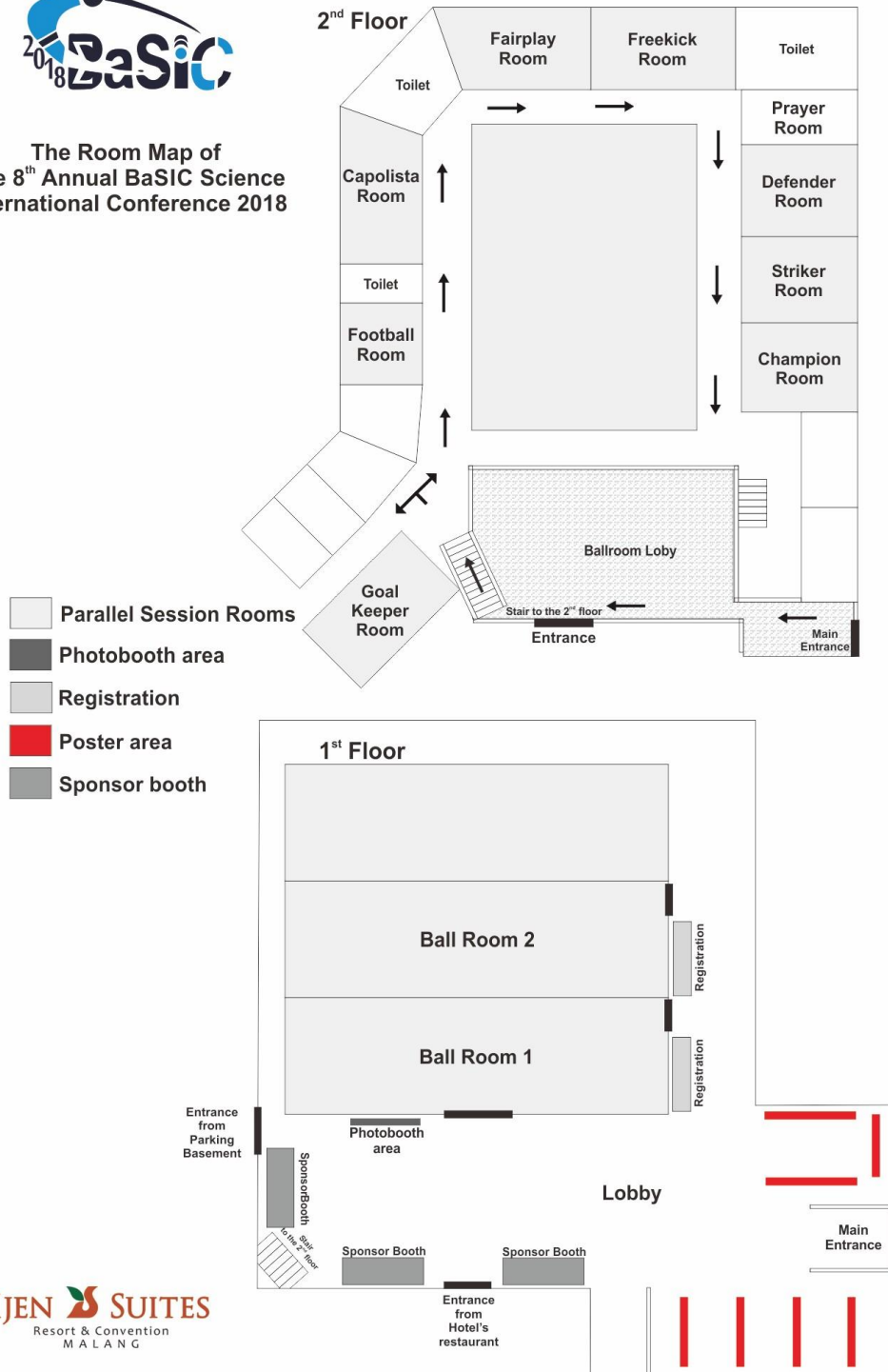
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Conference Venue



The Room Map of
The 8th Annual BaSIC Science
International Conference 2018



IJEN SUITES
Resort & Convention
MALANG

Schedule

Tentative time schedule of BaSIC 2018

Day 1 Tuesday, March 6th, 2018 - Vanue : Ballroom	
07.30-08.30	Registration
08.30-09.00	Opening Ceremony 1. Speech by Chairman of BaSIC 2018 2. Speech by Dean of Faculty of Mathematics and Natural Sciences 3. Welcome Dance
09.00-09.15	Coffee Break
PLENARY SESSION 1 (9.15 – 10.45), Moderator: Anna Safitri, PhD	
09.15-09.35	Prof. Mikio Nishizawa, M.D., Ph.D. <i>Ristumeikan University, JAPAN (Plant Medicines)</i> "iNOS Sense Oligonucleotides to Treat Septic Shock"
09.35-09.55	Prof. James R. Ketudat-Cairns, Ph.D. <i>University of Technology, THAILAND (Enzymology in Plants and Humans)</i> "The Structural Basis for Inborn Errors of Metabolism and Development"
09.55-10.15	Prof. Senthil Natesan Ph.D. <i>Center of Innovation, Agricultural College and Research Institute, Madurai, Tamil Nadu Agricultural University, INDIA (Plant Breeding Biotechnology)</i> "Cereal Domestication and its Impact on Crop Adaptation and Grain Nutrition"
10.15-10.45	Panel Discussion
PLENARY SESSION 2 (10.45 – 11.45), Moderator: Nurjannah, PhD	
10.45-11.05	Prof. Kostas Konstantinou <i>National Central University, TAIWAN (Volcano Seismology Volcanic Processes and Hazards)</i> "Forecasting Volcanic Eruptions by Using Permutation Entropy Variations In Ambient Seismic Noise"
11.05-11.25	Setia Pramana, Ph.D. <i>Sekolah Tinggi Ilmu Statistik, INDONESIA (Biostatistic and Bioinformatics)</i> "Machine Learning Development to Generate New Biomedical Understanding"
11.25-11.45	Panel Discussion
11.45-12.00	Sponsor Presentation
12.00-13.00	Lunch Break

Afternoon Session

Time	Program	Venue
12.45-13.15	Poster Presentation	Lobby
13.15-15.00	Parallel Session	Parallel room
15.00-15.30	Coffee Break	Lobby
15.30-17.00	Parallel Session	Parallel room

Day 2 Wednesday, March 7th, 2018 - Venue : Ballroom		
Time	Program	Venue
07.30-08.00	Registration & Morning Tea	Lobby
08.00-12.15	Parallel Session	Parallel room
12.15-13.00	Lunch Break	Lobby
13.00-15.30	Parallel Session	Parallel room
15.30-16.00	Coffee Break	Lobby
16.00-16.30	Closing Ceremony	Parallel room

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Separation Green Chemical From Wood Vinegar Produced from Pyrolysis of Jabon Wastes

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Abstract : The growth of red jabon wood is slightly slower than white jabon when planted on the same land. Excess jabon wood, among others, is not easy to bobok in eating insects, easily dried, smooth wood surface, easy to nail or drilled, and also the level of wood shrinkage when dried, including low. So jabon wood can be the material of making furniture, plywood, shoes, board, particle board, plywood raw materials, veneer, wood parking, plywood board, and others. The result of this combustion produced liquid smoke of wood jabon into distillate, charcoal. In this study used pyrolysis temperature 112-500 ° C. Analysis raw materail alpha cellulose 29,74%, hemicellulose 20,07% and lignin 29,18%. The potential for forestry and agricultural waste is still abundant and efforts should be made to process and utilized as biofuels. FT-IR analysis for jabon wood waste showed that the wave number 1101,35 cm⁻¹ indicated to dehydration and depolymerization of cellulose and hemicellulose content. Changes aromatic peak at 1620,21 cm⁻¹ indicates the presence of C-H, lignin. While the wave number 3450,65 cm⁻¹ indicate the presence of hydroxyl group (O-H) and the absorbance of 987,55 to 677,01 cm⁻¹ indicates the presence of C = C-H (Aromatic H). Analysis GC MS for Jabon wood Vinegar as carbamic acid 0,70%, acetic acid 9,32%, 2 cyclopenten-1-one 1,34%, oxetane 9,53%, n dodecanal 2,67%, cyclohexanone 7,69%, 3 methoxy pyracetechol 4,12%, benzene 5,08%, 2 propane 2,96%, trans 2 hydroxycyclohexanyl acetate 7,29%, and levoglucosan 8,99%. Application Jabon wood waste with pyrolysis technology as bio chemical dan wood vinegar yang renewable and sustainable.

INTRODUCTION

National energy provision is a problem that requires a strategic and comprehensive handling in which an ever-increasing population of Indonesia requires enormous energy handling, especially energy derived from biomass waste. Increasing energy consumption rate is not balanced with the availability of raw materials, especially fossil fuels. Therefore, the Government needs to seek renewable energy with environmentally friendly technology besides BBM with the utilization of biomass waste which is still abundant. So it is estimated that in a short time the fossil energy reserves will be exhausted. Fuel oil continues to thin out and adds to the uncertainty of the state budget, hampering the diversification of environmentally friendly energy, fueling smuggling of fuel, creating more and more irrational policies. Therefore, the Government needs to seek a source of renewable energy derived from biomass waste is still abundant with environmentally friendly technology Biomass production about 14% of the primary energy supply in the World. Approximately 75% is used by developing countries¹. for example southern Asian countries and southeast Asia, generating much of biomass energy as consumers. In India, Bangladesh, Myammar, Laos, the use of biomass energy is a significant source of energy^{2,3}. Indonesia is the largest exporter of charcoal in the world, with export volume reaching 29.867.000 kg. Increasing the added value of charcoal processed into nano carbon. Nano carbon weighing 5 grams valued at Rp.7 million and 25 gram nanoparticles alone valued Rp. 6 million. National policies that encourage the export of char products rather than raw materials. Or at least, meet The purpose of this research is to produce liquid smoke, charcoal and activated carbon wood of jabon with pyrolysis temperature setting and separating active bio chemical compound derived from liquid smoke of jabon wood for green chemical based on environment friendly and sustainable.

EXPERIMENTAL DETAILS

Wood waste in the form of wood jabon and jabon leaves analyzed the content of hemicellulose, cellulose and lignin. Then dry wood jabon dregs were analyzed water content up to 10-20% (w / w). The jabon wood is incorporated into a pyrolysis reactor with a combustion temperature of 116 - 516 ° C with 5 hours of burning time. The resulting liquid smoke formed through each stage is determined by the bottom of the kiln to the coolant, Liquid wood smoke Jabon GC MS analysis to determine potential chemical compounds and FT IR analysis of wood jabon powder is done to determine the functional group and SEM analysis

RESULT AND DISCUSSION

The result of jabon wood waste treatment by testing the moisture content to find the rendement contained jabon wood and calorific value is done by drying process by knowing the water content and the calorific value, then pyrolysis process to get the smoke of jabon bark (**FIGURE 1**).



FIGURE 1. Results of biomass waste processing in the form of wood jabon

The resul research. Before, thermal decomposition process has been carried out for biomass pyrolysis and its constituents, especially the content of cellulose, hemicellulose and different lignin types. Results of analysis of hemicellulose, cellulose and lignin content of jabon wood , can be seen in (**TABLE 1**).

TABLE 1. Results of analysis of hemicellulose, cellulose and lignin content of jabon wood

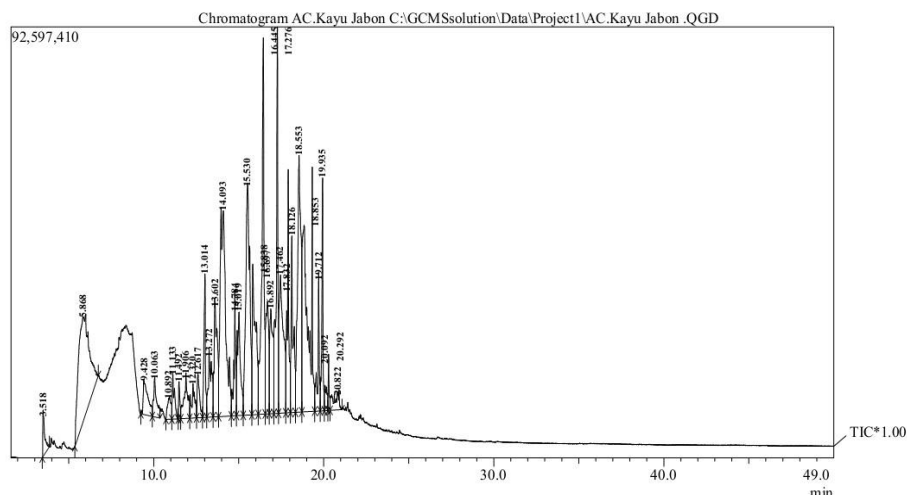
Sample Code	Content (%)		
	Lignin	α selulosa	Hemi Selulosa
Jabon Wood	29,18	29,74	20,07

These result, Based on the decomposition process known lignin content on jabon bark of 29.18%, alpha cellulose 29.74%, and hemicellulose 20.07%. can be seen Table 1. Lignin content depends on different types of raw materials. The result of other research, that the composition of raw materials in the form of pure biomass consists of 42% cellulose content, 31.5% hemicellulose, and 6.5% lignin at pyrolysis temperature 650K, 700K and 750K⁴. According to⁵. that the structure analysis of Napier grass Stem (NGS) has 12.07% extractives, 19.76% cellulose 38.75% hemiselulose, and lignin 26.99%). This suggests that pine lignin structures are composed solely by coniferyl alcohol alone, whereas by lignin the teak is composed by coniferyl alcohol and cinapyl alcohol in a given ratio⁶. Result of Dry Distillation (Prohibition) Jabon wood sample, with water content 9.5% with yield of charcoal equal to 37,9%, which result of pyrolysis obtained the highest liquid smoke content 28,06% at 316 ° C, The pine wood vinegar yiled obtaine were 13.80%, 16,12 %, 11,99%, 15,5%, and 0,90%¹². the content of dry destilation with Jabon wood Powder in the raw material. can be seen in (**TABLE 2**)

TABLE 2. Result of Dry Distillation (Rooting) with Jabon Wood powder

Temperature (°C)	Wood Vinegar	
	Weight (g)	Yield (%)
116	25	3,04
216	221,5	26,91
316	231	28,06
416	85	10,33
516	21	2,56

Analysis GC MS for Jabon wood Vinegar as carbamic acid 0,70%, acetic acid 9,32%, 2 cyclo penten-1-one 1,34%, oxetane 9,53%, n dodecanal 2,67%, cyclo hexanone 7,69%, 3 methoxy pyracetechol 4,12%, benzene 5,08%, 2 propane 2,96%, trans 2 hydroxy cyclo hexanyl acetate 7,29%, and levoglucosan 8,99% (**FIGURE 2**),. This shows that the liquid smoke component of wood jabon is experiencing the process of decomposition of hemicellulose, cellulose and lignin with rising temperature, so it is estimated that many acids are formed. The results of this study are supported by ⁷ that the compounds produced from corn stalk pyrolysis at 450 ° C contain ketones, furans, carboxylic acids and alcohols. Pyrolysis products from biomass waste produce levoglucosan and hydroxy methyl furfural (HMF) products as Biofuel ⁸. Charcoal production for fuel is a major cause of deforestation, environmental degradation, erosion, desertification and poverty ⁹. Analysis GC MS for Cacao wastes Majene produce n Buthane 8,77%, acetid acid 64,11%, and Mequinol 3,40% ¹⁰ Pyrolysis technology for biomass can be used for various products including electricity, transportation fuel, chemicals, fertilizers and bio charcoal ¹¹



The presence of a peak at 1620-1680 cm⁻¹ indicates the presence of C = CH (aromatic H) groups indicating the presence of C = CH (aromatic H) group.

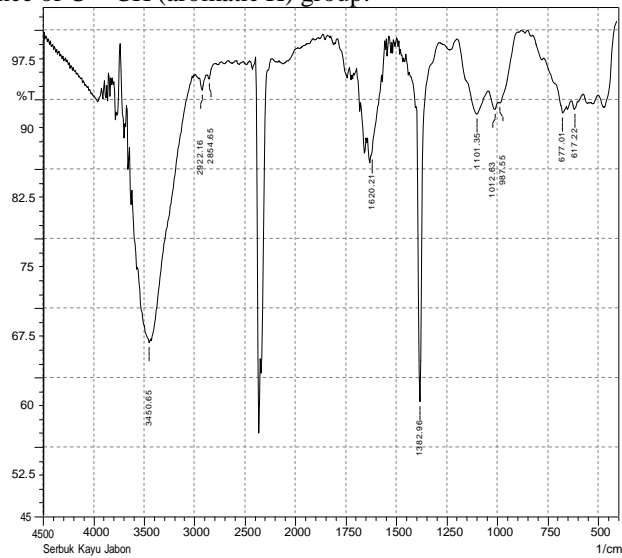


FIGURE 3. FTIR Spectrum Jabon Wood waste

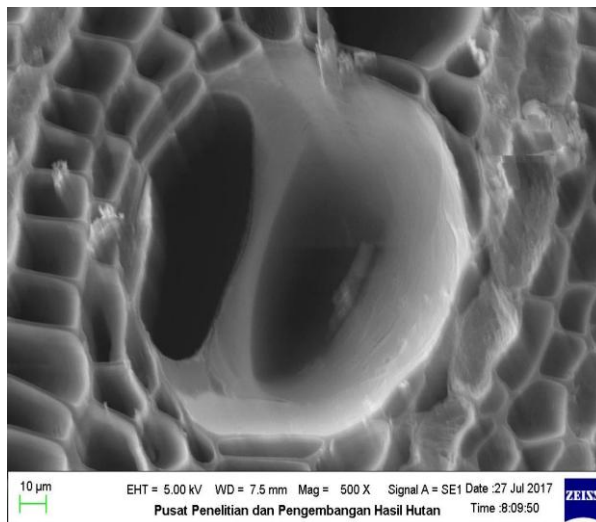


FIGURE 4. SEM analysis for Jabon bark 500x magnification.

The SEM analysis for the morphological structure of the bark of jabon showed a small pore structure with 50x magnification and had a large pore structure at 500 × (FIGURE 4) in which the SEM results for the jabon wood showed a small porous structure and many holes. This is supported by the SEM analysis explaining that the structure of morphology from Palm Oil boilers mill fly ash POFA has a natural pore

SUMMARY

Based on the objectives and research results that have been done can be drawn some SUMMARY as follows analysis Jabon wood produced compound hemiselulosa 20,07%, α selulosa 29,74% and lignin 29,18%, Analysis GC MS for Jabon wood Vinegar as carbamic acid 0,70%, acetic acid 9,32%, 2 cyclopenten-1-one 1,34%, oxetane 9,53%, n dodecanal 2,67%, cyclohexanone 7,69%, 3 methoxy pyracetechol 4,12%, benzene

5,08%, 2 prop The Proceedings of The 8th Annual Basic Science International Conference 2018 Application Jabon wood waste with pyrolysis technology as bio chemical renewable and sustainable.

ACKNOWLEDGMENTS

This research in a part of research funded by minister of Research, Technology and Higher Eduvational Republik of Indonesia, Research Grant berbasis PSNI I wish to thank you for facility laboratorium Wood Chemical and Biomass. Environmental and Forestry Ministry Republik of Indonesia Bogor.

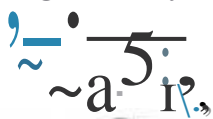
REFERENCES

1. M. Parikha, *J. Biomass and Bioenergy*. 27 : 613-620.(2004)
2. Koopmans.A. Biomass Energy Demand and Supply for Soth dan Southeast Asia. Assesing the Resource Base. *J. Biomass and Bioenergy*, 28 ; 133-150.(2005)
3. Bhattacharya, I.C, Abdul Salim, P, Pham, H.L, Ravindranath, N.H.. *J.Biomass and Bioenergy*. 25 : 471-482.(2003)
4. N.Kazakova. V Patkov. E, Mikailov. E. *Journal of chemical Technology and Metalurgy*. 50(3). 278-281. 2015
5. IY, Mohammad , YA. Abakr, FK, Kazi, Yusuf, S. Alshareef I, and Chin SA. *J. Bioresources* 10(4), 6457 - 6478. 2015.
6. S.Yaman *J.Energy Conversion and Management*, 45 : 651-671. 2004
7. Lv.G.J, Wu.S.B, and Lou. R. *J.Biores*. 5(4), 2051-2062. 2010.
8. M.Mettler D. Vlachos and J. Dauenhauer.. 2012. . *Energy Environ Sci*.
9. W.Gwenzi, N. Chaukura, F, Mukome, F. N. D., Machado, S., B. Nyamasoka. *J. Environmental Management* 250–261. 2014
10. M, Wijaya, and M, Wiharto. Proceeding th 1 st IBSC Towards the Extended of Basic Science for Enhancing, Health, Environmenatl, Energy and Biotechnology, 259-261, (2017).
11. S.H.Kong, S.K , Loh, R. Bachmann, S.A., Rahim, J. &SalimonJ. *J. Renewable and Sustainable Energy Reviews* 39: 729–739. 2014
12. M.Wijaya, E, Noor, TT Irawadi, G.Pari. *J.Science and Product Forest Technology*, 1(2), 73-77, (2008).
13. Rojith G, and Bright Singh I.S. 2011. Lignin Recovery, Biochar Production and Decolourisation of Coir Pith Black Liqour.

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