PROCEEDING

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FOREWORD

Sustainable development is development which meets the needs of the present without comprising the ability of future generations to meet their own needs. Sustainability is important because all the choices we pursue and all the actions that we make today will affect everything in the future. We need to make careful decisions at present in order to avoid limiting choices of the next generations at the future.

Sustainable development implies the fulfillment of several conditions: preserving the balance of the environment, preventing the exhaustion of natural resources, and optimizing the energy consumption. In the sustainable development action, there are many major challenges to be addressed. It requires us to re-think our growth in terms of social live that is more economical in its use of raw materials and energy. In this context, sustainable developments are now become an essential obligation.

Within the concept of rahmatan lil alamin, Islam considers it essential to preserve the environment and that the environmental management relies heavily on our actions today. To accommodate the above issues, the Faculty of Science and Technology of Maulana Malik Ibrahim State Islamic University dedicates an international seminar on science and technology "Innovation in Islamic perspective for sustainable development action toward international challenges".

We are delighted to invite the academicians, researchers, and practitioners to participate in this international seminar of

1. Natural science
2. Mathematics and Modeling
3. Computational Technology
4. Applied Science and Technology
5. Architecture
6. Pharmacy and Medical Technology

Best Regards

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INTERNATIONAL CONFERENCE

Innovation in Islamic perspective for sustainable development action toward international challenges

certificate

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This is to certify that

Mokh. Hairul Bahri

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STUDY ON THE ASH COMPOSITION OF *Albazia Falcataria*

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ABSTRACT

Search environmentally energy sources to reduce the impact of global warming is being done. The Government of Indonesia through SMRTI 2006 was developing and implementing science and technology fields of new and renewable sources of energy to support the security of energy supply in 2025 for the next of human survival. Biomass is a one of renewable energy. In this research, Sawdust Of Albazia Falcataria as solid fuel was investigated using SEM-EDAX to know the composition for preventing damage in heat exchanger. Problems in heat exchanger are slagging and fouling caused by biomass burning. The investigation of *Albizia Falcataria* were contains S, K before burning 0,27%, 0,56% and 0,49%, 0,82% for ash respectively. By using biomass energy as solid fuel decreased usage of fossil fuel to diminish global warming effect and sustainaibilty of the earthlife

Keywords
Albazia Falcataria; Renewable energy; Ash; biomass;

INTRODUCTION

Biomass as fuel was investigated by several researcher, they found that there were slagging and fouling when using biomass combustion in Boiler system. (Liao C 2007,88) (Giron RP 2012, 26(3)). Biomass was potential resources of energy because they can grow fastly than fossil fuels. They can be as balancer in the world, use CO_2 to grew up and release O_2. This research goal was to identified the element contains of Albazia Falcataria as solid fuel.

MATERIAL AND METHOD

Fresh sawdust of Albazia Falcataria was collected from local sawmill business at Lumajang State, East Java Provincy, Indonesia.

Investigation using SEM-EDAX conducted at Central Laboratorium, Physics Department, Mathematics and Natural Sciense Faculty, State University of Malang by compare fresh sawdust of Albazia falcataria and the ash from reactor combustion. Reactor temperature set to 900 ^{o} C as similar to commons boiler (Konsomboon et al. 2011).

RESULT AND DISCUSSION

Combustion of biomass released amount of Cl and S, also alkali metals such K and Na. It shows in table 1 that percentage of Sulfur (S) and Potassium (K) increased from 0.27% to 49% and 0.56% to 0.82% respectively. Potassium primally exist as $KCl_{(g)}$ and $KOH_{(g)}$, while Sulphur and Chlorine are present as $SO_{(g)}$ and $HCl_{(g)}$. There was Chlorine in the combustion of Albazia Falcataria, it means KCl compound will be established during Albazia Falcataria combusted. With decreasing temperature $KOH_{(g)}$ is converted to $K_2SO_{4(g,s)}$ and K_2CO_3 by gas phase reaction, while $KCl_{(g)}$

condensed as $KCl_{(s)}$. According to chemical equilibrium all sulphur should be bond as solid K_2SO_4 (Christensen 1995).

Table 1. Element Contains in Fresh Sawdust of Albazia Falcataria and The Ash

Element	Fresh Sawdust		Ash	
	Wt%	At%	Wt%	At%
C	10.54	18.74	54.53	62.15
O	35.25	47.05	43.15	36.93
Na	02.81	02.61		
Mg	02.00	01.76		
Al	01.82	01.44	00.38	00.22
Si	14.06	11.07		
P	01.36	00.94	00.23	00.10
S	00.38	00.25	00.27	00.12
K	02.93	01.60	00.56	00.20
Ca	24.55	13.08	00.51	00.17
Fe	03.80	01.45		
Cl			00.35	00.14

Source: Independent experiment

CONCLUSION

Result from this experiment shows that Sawdust of Albazia Falcataria has potential properties as solid fuel but it must be reduced and controlled S, Cl and K

By using biomass energy as solid fuel will decreased usage of fossil fuel to diminish global warming effect and sustainaibilty of the earthlife.

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