

STUDY ON THE ASH COMPOSITION OF *Albazia Falcataria*

Mokh. Hairul Bahri

Student of Doctorate Program of Mechanical Engineering Science, University of Brawijaya Malang
Mechanical Engineering Department, University Of Muhammadiyah Jember
Email : mhairulbahri@yahoo.com

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 sustainability 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 CO₂ to grew up and release O₂. 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 Science Faculty, State University of Malang by compare fresh sawdust of Albazia falcataria and the ash from reactor combustion. Reactor temperature set to 900 ° 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 K₂SO_{4(g,s)} and K₂CO₃ by gas phase reaction, while KCl_(g)

condensed as KCl_(s). According to chemical equilibrium all sulphur should be bond as solid K₂SO₄ (Christensen 1995).

Table 1. Element Contains in Fresh Sawdust of Albazia Falcatoria 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 Falcatoria 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 sustainabilty of the earthlife.

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