

CENTER OF EXCELLENT GEOPOLYMER & GREEN TECHNOLOGY



UNIVERSITI MALAYSIA PERLIS SCHOOL OF MATERIALS ENGINEERING



Umap

Inventors:

- Faizul Che Pa
- Noorina Hidayu Jamil Ruhiyuddin Mohd Zaki
- Shahrizam Saad
- Murizam Darus
- Che Mohd Ruzaidi Ghazali Mohamed Faisol Mohamed Nor

Contact Details:

School Of Materials Engineering, Universiti Malaysia Perlis, Kompleks Pusat Pengajian Jejawi 2, 02600 Jejawi, Perlis Malaysia Tel: +604-9798154 Fax: +604-9798178

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Problem Statement

A large quantity of agricultural wastes, especially palm ash found in Malaysia. These wastes are needed to be disposed properly, otherwise it may cause a major environmental sustainable issue. Most of raw materials used to produce existing commercial glass are imported and hazardous; therefore it is the best time to highlight the potential of local natural waste as the raw material in production of

Objectives

Using agricultural wastes (palm ash) as raw material in

glass.

Produce alternative, safe and low cost glass materials.

glass production.

Process

Agricultural Waste



Kaolin & Feldspar / Dolomite



Eco-Glass

Data / Result

Table 1: Chemical Composition (%)

Compound	SiO ₂	CaO	FeO	K ₂ O	MgO	Al ₂ O ₃
Palm Ash	22.10	13.20	1.65	52.70	2.30	-
Eco-Glass	48.60	12.70	2.68	21.50	2.70	6.41

Table 2: Cost Comparison

	Cost (RM) / kg
Commercial Glass	1.70
Eco-Glass	0.50

Novelty

- Using agricultural waste in making glass.
- Alternative, safe and low cost of materials in making glass.
- Turn waste into wealth.

Commercial Potential

- ▼ The price for the Eco-Glass product is cheaper compared to the commercial glass because of the availability of the empty fruit bunch throughout the year.
- This study contributes in saving the environment from the abundance agricultural waste especially in term of open burning activity.

Product Description

- Eco-Glass is an eco-friendly product which is use agricultural waste (palm ash) as raw material in making glass. Recycling of agricultural wastes as a raw material for Eco-Glass hugely reduce the unnecessary materials on land and reducing the disposal cost.
- ✓ The term "ECO" is drawn from the idea that the glass is eco-friendly and economical. It is economical because it uses about 60% - 80% of palm ash as a main ingredient in the formula.



Figure 1: Palm Ash

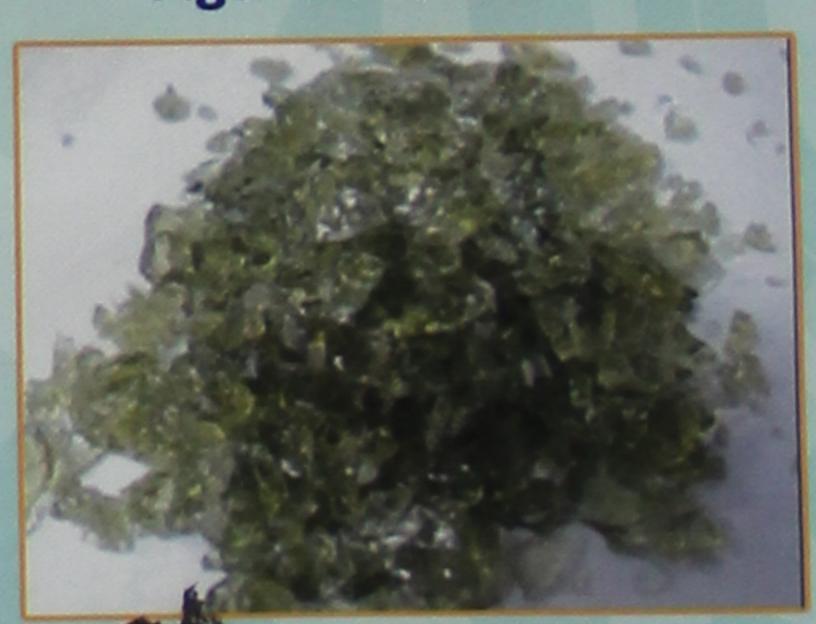


Figure 2 : Solid Glass



Figure 3: Eco-Glass





Figure 4: Potential Application



