

## Introduction

Plastic waste has a serious negative impact on the environment. On the other hand, biodegradable polymers such as starch are decomposed by microorganisms, and glycerin is often used as their plasticizer. In this research, we used glycerin pitch extracted from used cooking oil. We conducted joint research with a student of Universiti Putra Malaysia and conducted experiments using different oil. Glycerin pitch can be converted into valuable products, providing a sustainable and economically viable solution to waste disposal challenges.

## Objective

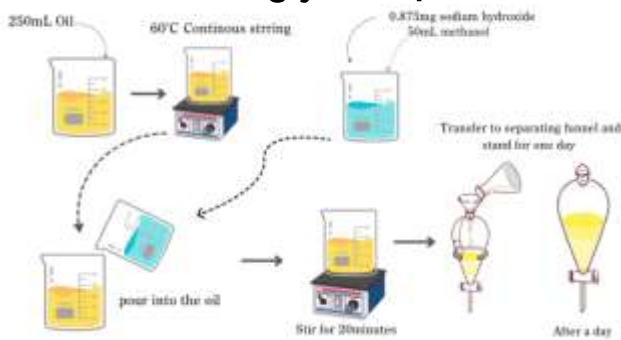
1. To characterize the mechanical properties of glycerin pitch plasticized starch film
2. To evaluate the biodegradation behaviour of glycerin pitch plasticized film under controlled composting conditions

## Materials

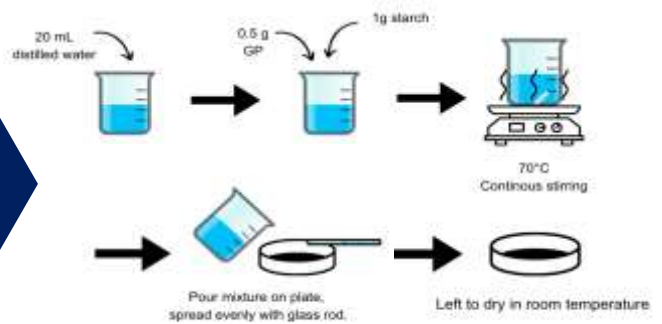
Used canola oil (Yokohama Science Frontier High School), Used palm oil (Universiti Putra Malaysia) Sodium hydroxide, Methanol, Distilled water, Soil, Starch, Petri dish, Tensile strength tester, Glass jar, Weighing scale, Magnetic stirrer

## Methodology

### How to make glycerin pitch



### How to make the films

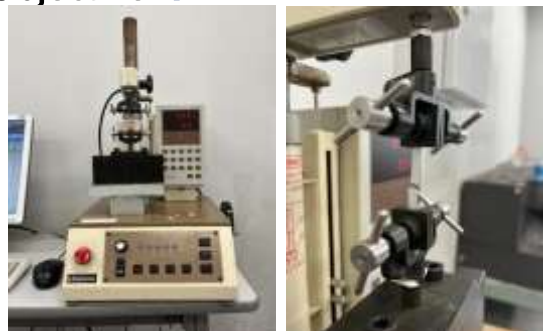


Yokohama Science Frontier HS



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## Objective 1



Check mechanical properties: Tensile strength (MPa)

## 2nd objective



- ① Bury the sample in biomass soil
- ② Check the degree of biodegradation
- ③ Use the formula to find the weight loss rate:

$$W_{\text{loss}} (\%) = \frac{W_0 - W_1}{W_0} \times 100$$

W<sub>0</sub> is the weight of the dried samples before soil burial.  
W<sub>1</sub> is the weight of the samples after soil burial.