

3.2 Materials

3.2.1 Equipment

These materials will be processed into bioplastic films using several pieces of equipment, including :

- a. Digital Scales



Figure 3.1 Digital Scales

This instrument is used to weigh the materials involved in sample preparation for this research. It has a maximum capacity of 300 grams. The digital scale utilized is illustrated in Figure 3.1.

- b. Blender

The blender processes the purple sweet potato and water into a slurry by reducing the particle size of the purple sweet potato.

- c. Strainer

A 200-mesh strainer is used to separate the pulp from the blended purple sweet potato slurry, allowing the starch to be collected.

- d. Vacuum Oven



Figure 3.2 Vacuum Oven

The vacuum oven is used to dehydrate the sample under controlled time and temperature conditions. The oven utilized in this study has a maximum temperature capacity of 300 °C. The equipment is shown in Figure 3.2.

e. Petri Dish

A Petri dish, measuring 14.5 cm in diameter and 1.5 cm in height, is used to hold and shape the sample during the molding process.

f. Chemical Glass

A chemical glass with a capacity of 250 ml is used to hold the sample throughout the experiment. It also serves as a container for mixing the materials used in the formulation.

g. Desiccator



Figure 3.3 Desiccator

A desiccator is used to store the sample while maintaining a controlled air environment, ensuring the sample retains its properties effectively.

h. Hot Plate Magnetic Stirrer



Figure 3.4 Hot Plate Magnetic Stirrer

The Daihan Scientific magnetic stirrer hot plate, model MSH-20D, is employed to simultaneously stir and heat the starch-based bioplastic solution. It operates within a temperature range of 25°C to 280°C and offers a maximum stirring speed of 1500 rpm.

i. Ultrasonic Cell Crusher



Figure 3.5 Ultrasonic Cell Crusher

The Ningbo Yinzhou Sjia ultrasonic cell crusher, model SJIA-1200W, is used to ultrasonicate the starch solution. This device operates with a power capacity ranging from 120 to 1200 watts.

j. Spatula

A spatula is used to transfer small amounts of chemicals. In this study, multiple spatulas were employed to ensure that each compound was handled with a separate tool, preventing cross-contamination.

k. Stereo Microscope



Figure 3.6 Stereo Microscope

The stereo microscope is used to measure the width and thickness of the tensile test samples. Measurements are taken at three predetermined points on each sample prior to conducting the tensile test.