

KARAKTERISTIK FISIK DAN MEKANIK *BIODEGRADABLE FOAM* DARI AMPAS ONGGOK AREN DAN JERAMI PADI DENGAN VARIASI JENIS BAHAN PEREKAT

INTISARI

Oleh:

KANDIDA TRAJUNING SETYANUM
20/460628/TP/12838

Permasalahan sampah terutama sampah plastik menjadi salah satu isu penting saat ini. Penggunaan kemasan sekali pakai terutama *styrofoam* dapat meningkatkan timbunan sampah dan berbahaya bagi kesehatan manusia serta lingkungan karena sulit terurai. Tidak hanya sampah plastik, sampah organik sisa produksi industri pertanian juga dapat mencemari lingkungan. Rumusan masalah dari penelitian ini adalah terdapat potensi limbah jerami padi yang mengandung selulosa dan serbuk ampas onggok aren yang mengandung pati dapat diolah menjadi bahan dasar pembuatan *biodegradable foam* dan perlunya pengujian karakteristik *biodegradable foam*. Tujuan dari penelitian ini untuk menghasilkan variasi *biodegradable foam* dari ampas onggok aren dan jerami padi dengan variasi proses *bleaching* jerami padi dan jenis bahan perekat serta mengetahui karakteristik *biodegradable foam*.

Penelitian ini menggunakan bahan dasar yaitu jerami padi dan ampas onggok aren. Pada proses ini digunakan jerami padi yang dilakukan proses delignifikasi NaOH 5% kemudian dilakukan proses *bleaching* dengan variasi *non-bleaching*, *bleaching* hidrogen peroksida, dan *bleaching* asam perasetat. Setelah itu, bahan-bahan dicetak dengan variasi jenis bahan perekat berupa PVA, PLA, PEG, dan tepung tapioka. Setelah itu, *biodegradable foam* diuji karakteristik fisik berupa daya serap air dan densitas, karakteristik mekanik berupa kuat tarik, dan pengujian biodegradabilitas.

Hasil dari pengujian tersebut yaitu serbuk ampas onggok aren dan jerami padi dapat dibuat menjadi *biodegradable foam* dan menghasilkan beda nyata setiap sampel terhadap uji karakteristik. *Biodegradable foam* terbaik terhadap karakteristik fisik berupa daya serap yaitu dengan menggunakan perekat PVA dan jerami *non-bleaching* (A1B1) dan untuk densitas yaitu dengan menggunakan perekat tepung tapioka dan jerami padi *bleaching* asam perasetat (A4B3). *Biodegradable foam* terbaik untuk kuat tarik yaitu dengan perekat tepung tapioka dan jerami *non-bleaching* (A4B1). Berdasarkan biodegradabilitas, *biodegradable foam* terbaik yaitu dengan perekat tepung tapioka dan jerami *bleaching* hidrogen peroksida (A4B2).

Kata kunci: Ampas Onggok Aren, Bahan Perekat, *Biodegradable Foam*, *Bleaching*, Jerami Padi

PHYSICAL AND MECHANICAL CHARACTERISTICS OF BIODEGRADABLE FOAM FROM SUGAR PALM STARCH DREGS AND RICE STRAW WITH VARYING TYPES OF ADHESIVE MATERIALS

ABSTRACT

By:

KANDIDA TRAJUNING SETYANUM
20/460628/TP/12838

Waste is one of the important issues nowadays. The use of single-use packaging, especially styrofoam, can increase landfill and is harmful to human health and the environment because it is difficult to decompose. Not only plastic waste, the leftover organic waste from agricultural industry production can also pollute the environment. The formulation of the problem from this research are the potential for rice straw waste containing cellulose and sugar palm pulp starch powder containing starch to be processed into basic materials for making biodegradable foam as well as the need to test the characteristics of biodegradable foam. The purpose of this study are to produce variations of biodegradable foam from sugar palm starch pulp and rice straw with variations in the rice straw bleaching process and types of adhesives as well as identify the characteristics of biodegradable foam.

This research uses rice straw and sugar palm starch dregs as basic materials. In this process, rice straw undergoes delignification process with 5% NaOH, then continued by a bleaching process with variations of non-bleaching, hydrogen peroxide bleaching, and peracetic acid bleaching. Afterwards, the materials were mold with thermopressing process with the variations of adhesive materials that is PVA, PLA, PEG, and tapioca flour. After that, the biodegradable foam tested for physical characteristics in the form of water absorption and density, mechanical characteristic in the form of tensile strength, and biodegradability testing.

The result of the test found that the pulp of sugar palm starch dregs and rice straw can be made into biodegradable foam as well as produces a real difference in each sample on the characteristics test. The best biodegradable foam for physical characteristics in the form of absorption is using PVA adhesive and non-bleaching rice straw (A1B1). Then, the best result for the density is using tapioca flour adhesive and peracetic acid bleached rice straw (A4B3). The best biodegradable foam for tensile strength is using tapioca flour adhesive and non-bleaching rice straw (A4B1). Based on biodegradability, the best biodegradable foam is formed using tapioca flour adhesive and hydrogen peroxide bleaching rice straw (A4B2).

Keywords: Sugar Palm Starch, Adhesive Materials, Biodegradable Foam, Bleaching, Rice Straw