ABSTRAK

PEMANFAATAN SABUT KELAPA DAN PATI SINGKONG SEBAGAI BAHAN BAKU PEMBUATAN BIODEGRADABLE FOAM (BIOFOAM) DITINJAU DARI PENGARUH VARIASI PENAMBAHAN GLISEROL DAN KITOSAN

(Lupita Sari, 2025, 43 Halaman, 10 Tabel, 16 Gambar,4 Lampiran)

Permasalahan pencemaran lingkungan akibat limbah plastik dan styrofoam mendorong pengembangan bahan alternatif yang ramah lingkungan, salah satunya adalah biodegradable foam (biofoam). Penelitian ini bertujuan untuk memanfaatkan sabut kelapa dan pati singkong sebagai bahan baku utama biofoam, dengan penambahan gliserol sebagai plastisizer dan kitosan sebagai penguat struktur. Metode pembuatan biofoam dilakukan melalui proses baking dengan variasi konsentrasi gliserol (0%, 1%, 1,5%, 2%) dan kitosan (0%, 1%, 1,5%, 2%) untuk mengamati pengaruhnya terhadap sifat fisik biofoam, meliputi kuat tarik, daya serap air, dan biodegradabilitas. Hasil penelitian menunjukkan bahwa variasi konsentrasi gliserol dan kitosan memberikan pengaruh signifikan terhadap karakteristik biofoam. Kombinasi gliserol 1,5% dan kitosan 1,5% menghasilkan kuat tarik tertinggi sebesar 1,585 N/mm², sedangkan kombinasi gliserol 1% dan kitosan 2% memberikan nilai daya serap air terendah (1,81%) dan biodegradabilitas tertinggi (15,15%). Berdasarkan analisis ANOVA, gliserol memberikan pengaruh signifikan terhadap daya serap air ($p < 0,05$), sementara kitosan tidak memberikan pengaruh signifikan secara statistik. Formulasi gliserol 1,5% dan kitosan 1,5% direkomendasikan sebagai komposisi terbaik untuk menghasilkan biofoam yang seimbang secara mekanik dan fungsional, serta berpotensi sebagai alternatif kemasan ramah lingkungan.

Kata kunci: biofoam, sabut kelapa, pati singkong, gliserol, kitosan, biodegradable

ABSTRACT

UTILIZATION OF COCONUT HUSK AND CASSAVA STARCH AS RAW MATERIALS FOR THE PRODUCTION OF BIODEGRADABLE FOAM (BIOFOAM) IN TERMS OF THE EFFECT OF VARIATIONS IN GLYCEROL AND CHITOSAN ADDITION

(Lupita Sari, 2025, 43 Pages, 10 Tables, 16 Figures, 4 Appendices)

Environmental pollution caused by plastic and styrofoam waste has encouraged the development of eco-friendly alternative materials, one of which is biodegradable foam (biofoam). This study aims to utilize coconut husk and cassava starch as the main raw materials for biofoam production, with glycerol as a plasticizer and chitosan as a structural enhancer. The biofoam was prepared using the baking method with variations in glycerol (0%, 1%, 1.5%, 2%) and chitosan (0%, 1%, 1.5%, 2%) concentrations to observe their effects on the physical properties of the biofoam, including tensile strength, water absorption, and biodegradability. The results show that varying concentrations of glycerol and chitosan significantly affect the characteristics of the biofoam. The combination of 1.5% glycerol and 1.5% chitosan yielded the highest tensile strength of 1.585 N/mm², while the combination of 1% glycerol and 2% chitosan produced the lowest water absorption (1.81%) and highest biodegradability (15.15%). Based on ANOVA analysis, glycerol significantly affected water absorption ($p < 0.05$), whereas chitosan had no statistically significant effect. The combination of 1.5% glycerol and 1.5% chitosan is recommended as the optimal formulation for producing biofoam with balanced mechanical and functional properties, making it a promising alternative for environmentally friendly packaging.

Keywords: *biofoam, coconut husk, cassava starch, glycerol, chitosan, biodegradable*