



APPLICATION OF CIRCULAR ECONOMY IN FURAN PRODUCTION FROM EMPTY OIL PALM BUNCHES

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ABSTRACT

Nabil Muzhaffar. “Implementation of Circular Economy in Furan Production from Empty Oil Palm Fruit Bunches”. Supervised by SUPRIHATIN and ERLIZA HAMBALI.

This study aims to apply the concept of circular economy in the production of furan from empty fruit bunches of oil palm (TKKS), focusing on resource efficiency, waste reduction, and value creation. TKKS was selected as the feedstock due to its high hemicellulose content, which can be converted into furan through hydrolysis and dehydration processes. The designed process incorporates the recovery of solvents such as *Tetrahydrofuran* (THF) and formic acid, achieving purification efficiencies of 80% and 98.8%, respectively. The reuse of solvents and liquid waste successfully reduced operational costs and minimized waste generation. The production cost of furan was reduced from Rp1,176,879/kg to Rp296,399/kg. Additionally, the process was able to reduce solid waste by up to 70%. The involvement of various stakeholders such as oil palm farmers, palm oil mills, downstream furan users, and supporting institutions strengthens the feasibility of implementing an integrated circular system from upstream to downstream. The results indicate that the application of circular economy principles at the laboratory scale provides a solid foundation for the development of a more efficient and sustainable bioindustry.

Keywords: sustainability, waste management, circular economy, furan, empty fruit bunches

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APPLICATION OF CIRCULAR ECONOMY IN FURAN PRODUCTION FROM EMPTY OIL PALM BUNCHES

NABIL MUZHAFAR

Undergraduate Final Report
one of the requirements for obtaining a degree of
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at
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**DEPARTMENT OF AGRICULTURAL INDUSTRIAL TECHNOLOGY
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INTRODUCTION

Praise and gratitude be to Allah subhanaahu wa ta'ala for all His gifts so that this scientific work was successfully completed. The theme chosen in the research which was carried out from May 2025 to July 2025 was Circular economy analysis, with the title "Application of Circular Economy in the Production of Furan from Empty Oil Palm Bunches".

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Hopefully this scientific work will be useful for those in need and for the advancement of national science both on a national and international scale

Bogor, July 2025

Nabil Muzhaffar



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