

Production of Bioethanol from Agricultural Waste via Membrane Technology

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Abstract: *In the context of rapid industrialization and the increasing demand for sustainable energy sources, bioethanol presents a promising alternative to traditional fossil fuels. This research investigates the production of bioethanol from agricultural waste, specifically using bagasse, and employs membrane technology for purification. The fermentation of 1 kg of bagasse yielded approximately 800-850 ml of ethanol, demonstrating the efficiency of converting lignocellulosic biomass into bioethanol. The integration of membrane technology resulted in ethanol purity levels of 98-99%, highlighting its potential in achieving high-quality ethanol with reduced energy inputs. This study underscores the viability of utilizing agricultural waste as a feedstock for bioethanol production and emphasizes the role of membrane technology in enhancing both yield and purity. The findings support the potential for large-scale implementation, contributing to energy security and environmental sustainability*

Keywords: bioethanol, agricultural waste, bagasse, membrane technology, ethanol purification, renewable energy, lignocellulosic biomass, sustainable fuel, fermentation, energy efficiency