

# CATALYTIC BIO-SLURRY DEGRADATION TO BIOFUELS USING AN ELECTROLYTIC BIOMASS SOLAR CELL

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## Abstract

This study focused on the production of hydrocarbon fuels from bio-slurry through an innovative electrolytic process powered by solar energy. The bio-slurry, a byproduct of anaerobic digestion, presents disposal challenges, especially in areas without farmlands for use as organic biofertilizer. To address this issue and contribute to cleaner energy production, the study aimed to catalyze bio-slurry degradation into hydrocarbon fuels using an Electrolytic Biomass Solar Cell (EBSC). Powered by a 40W solar panel, the setup employed a 9,000mL bio-slurry capacity, alongside geo-catalysts and iron oxide catalysts to enhance the efficiency of degradation and gas production. The experiment yielded significant volumes of biofuels, including bio-methane (20.42%), bio-ethane (24.00%), and propane (35.10%), with gas composition analyzed via GC-MS. The use of the 'ebarra' (a geo-catalyst) electrocatalyst significantly increased methane and ethane production. This process presents a sustainable method for converting bio-slurry into valuable hydrocarbon fuels, contributing to environmental conservation and renewable energy development.

**Keywords:** Hydrocarbon fuels, bio-slurry, electrolytic biomass degradation, solar energy, electrocatalysts.