

# Bioethanol Production from coffee grounds: Sustainable energy

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## Introduction :

Biofuels are fuels produced from renewable raw materials, such as biomass, which are generally of plant origin. They are considered an alternative to fossil fuels such as gasoline and diesel. Biofuels represent a renewable energy source, with little environmental harm, and represent a sustainable and sustainable development path. Biofuels can replace fossil fuels and help ensure economic stability.

This paper focuses on two key aspects: environmental and energy aspects, the study of the feasibility of producing second-generation carbohydrate as a sustainable fuel. We conducted a laboratory experiment, which proved to be conclusive, enabling the production of bioethanol, the biomass chosen in our research work is coffee grounds, it is a residue rich in sugar with a fraction of 38mg/100mg of dry matter; this substrate is available and has a large tonnage all over the world. Secondly, the alcoholic fermentation process confirms the efficient transformation of sugars present in coffee grounds into bioalcohol, the bioethanol produced after distillation of the fermentation wine has a refractive index close to that of surgical alcohol, with a value of 1.3620. The bioethanol produced after distillation of the fermentation wine has a refractive index similar to that of surgical alcohol, with a value of 1.3620. The flammability test proves that the bioethanol produced during the fermentation of coffee grounds is flammable and has a percentage greater than 70%. The results obtained were positive, confirming the efficient transformation of sugars present in coffee grounds into a bioalcohol.

## Résultats :



Fig. 1 Biomass : Coffee grounds

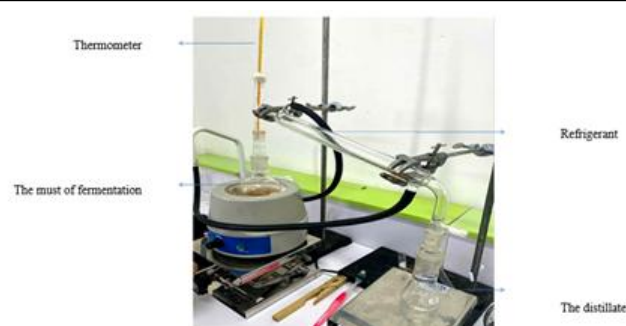


Fig. 2 Assembly for the recovery of bioethanol by distillation

## **Conclusion :**

In conclusion, due to industrial growth and growing transportation needs, energy demand continues to grow. However, the continued use of non-renewable fossil fuels such as oil, coal, and natural gas is leading to the depletion of these limited reserves. To address this challenge, an economically viable alternative is emerging in the form of bioethanol, a renewable biofuel made from plant biomass. Ethanol, a commonly used biofuel, tends to produce less CO<sub>2</sub> when burned. Ethanol's CO<sub>2</sub> emissions are generally lower than those of other hydrocarbon-based fuels.

## **Références :**

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