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Letter to Editor

Prospective on Biotransformation of Paper Waste into Biofuel

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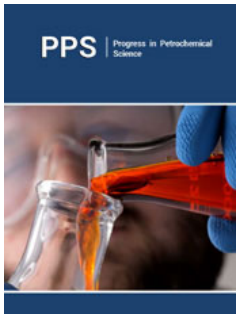

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Abstract

Waste paper, a large component of municipal waste, can be recycled into bioethanol, a sustainable and environmentally friendly fuel. Many researches have created ethanol from print-grade paper, but there is little literature on the conversion of waste cartons. In this letter, I suggested that scrap corrugated boxes and print-grade papers could be reduced to slurries and tested for biosynthesis suitability by using physical and chemical methods. Cellulose fibers in the slurries were hydrolyzed directly into glucose without first being pretreated with weak hydrochloric acid and then fermented into ethanol by using biomolecules.

Keywords: Paper waste; Biofuel; Biomolecules; Hydrolysis

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The generated biofuel can be tested for density, flammability, color, odor, non-volatile residue and other qualitative characteristics. Waste cartons and paper slurries could produce substantially more glucose and have greater extraction efficiency during cellulose hydrolysis. the ethanol produced from both slurries would have the same physical and chemical properties similar to laboratory grade biofuel.

Paper waste accounts for around 35% of municipal solid trash by weight, making it a significant component of many landfills. This is because paper and paper materials are found in practically every finished consumer product, including tissue papers for sanitation, newsprint for newspapers, cardboard paper for electrical/electronic components, shoe sole inserts and so on. The worldwide paper industry is expected to produce approximately 500 million tons of paper and board per year. Only a small portion of this material is recycled, with the great majority of paper goods being dumped or burned as rubbish. Burning releases the embedded carbon into the atmosphere in the form of greenhouse gases. Recycling or upcycling wastepaper into valuable biomaterials is still the most efficient form of disposal.

The production of gasoline ethanol from renewable resources such as plant biomass is one of the most promising alternatives to traditional petroleum-based fuels, which have their own set of environmental challenges. Plant-based bioethanol has sparked debate due to concerns about energy balance, life cycle carbon dioxide emissions and rivalry with food production. The majority of bioethanol produced worldwide is now derived from starch and molasses, such as sugar cane or sugar beets, as well as starch-rich raw materials, such as corn and wheat and the majority of these agriculturally based resources are needed by humans for sustenance. This has resulted in a struggle between the energy and food sectors. Due to their importance in human and cattle consumption, starch and molasses are insufficient raw material sources for biofuel generation. Some sources attribute the quick rise in global food prices to the United States' increased production of biofuels, particularly corn-based ethanol [6]. As a result, second-generation bioethanol from lignocellulosic biomass and wastes has emerged, offering a variety of economic and environmental advantages.

In general, paper waste papers can be recycled 6-7 times, although they are often recycled only 2-4 times. It often yields lower-quality paper products when paper is recycled, Paper fiber shorten as they are recycled. Because reducing the paper fibers reduces the paper's quality, some of it will still be sent as scrap. This contains a significant and underutilized supply of sugar/cellulose, which can be converted to ethanol and used as an energy source, providing environmental and energy benefits. The decomposition of paper wastepaper in landfills and incineration is considered damaging to the environment since it emits greenhouse gases. To overcome these difficulties, bioethanol can be created from a variety of wastes and wastepaper.

Actually, the basic phases in ethanol manufacturing are microbiological sugar fermentation, distillation, dehydration and denaturation. However, microbial fermentation now works directly with sugars since only the sugars and starch components can be economically converted, but cellulose cannot be easily converted because it is more stable. The reason could be that lignocellulosic biomass is primarily composed of lignin and carbohydrates (cellulose and hemicellulose). Thus, the goal, difficulty and feature would be to manufacture bioethanol from office paper waste by using biomolecules and several low-cost pretreatment procedures that allowed the cellulose part of the paper to be easily converted. The hydrolysis of the cellulosic material found in office paper waste by using dilute acid pre-treatment and heat pre-treatment allowed the cellulose units to be liberated and acted on biomolecules. Different physical and chemical (hydrolysis pre-treatment methods) like acid treatment and hear pre-treatment can be used to assess, compare and examine the various levels of bioethanol produced. The samples can be fermented and the alcohol oxidation can be determined.