Archives in Chemical Research
ISSN: 2572-4657

Open access Commentary

The Chemistry behind the Biofuels and its Positive Effects on the Environment

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DESCRIPTION

Any fuel made from biomass, often known as plant, animal, or algal waste, is referred to as a biofuel. Due to how easily such feedstock materials may be replaced, biofuel is seen as a form of renewable energy as opposed to fossil fuels like petroleum, coal, and natural gas. Biofuel is frequently marketed as a cost-effective and environmentally friendly substitute for petroleum and other fossil fuels, particularly in light of the rising price of petroleum and growing concern over the role that fossil fuels play in contributing to global warming. Many critics express concerns about the scope of the expansion of certain biofuels due to the economic and environmental costs of the refining process as well as the potential loss of sizable tracts of arable land from food production. Wood, for example, is a biofuel that has been used for a long time and may be burned directly to provide heat. Thus, the intensity can be used to power generators in a power plant to produce electricity. Numerous current power plants burn biomass, such as wood, grass, and other materials.

Liquid biofuels are of special importance due to the large infrastructure that is already in place to utilize them, notably for transportation. Ethanol, often known as ethyl liquor, is the liquid biofuel that has received the most attention and is produced by ripening grain or sugar. Brazil and the US are the two countries that produce the most ethanol. To create "gasohol," a fuel that includes 10% ethanol, ethanol biofuel is commonly mixed with gasoline in the United States. Typically, corn (maize) grain is used to make the bulk of it. In Brazil, where it is predominantly generated from sugarcane, ethanol biofuel is commonly used as a 100% ethanol fuel or in gasoline mixes comprising 85% ethanol. In contrast to "first-generation" ethanol biofuel produced from food crops, second-generation cellulosic ethanol is made from low-value biomass with a high cellulose concentration, such as wood chips, crop residues, and municipal garbage. Grasses that may be grown on poor quality land or sugarcane bagasse, a byproduct of the sugar manufacturing, are often used to make cellulosic ethanol. Due to its lower conversion rate than first-generation biofuels, cellulosic ethanol is mostly used as a gasoline additive.

The second most popular liquid biofuel is biodiesel, which is largely made from oily plants like soybean or oil palm and, to a lesser extent, from other oily sources such leftover cooking fat from deep-frying restaurants. In diesel engines, biodiesel is often blended with petroleum diesel fuel in various ratios. This fuel is most popular in Europe. Despite its potential, it has been difficult to commercially develop the use of algae and *cyanobacteria* as a source of "third-generation" biodiesel. Lipids, which can be converted into biodiesel or artificial petroleum, can makeup up to 40% of the weight of some algae species. Compared to second-generation biofuels, some estimates claim that algae and *cyanobacteria* can produce 10 times to 100 times more fuel per unit of area.

When evaluating the economic advantages of biofuels, it is important to include the energy needed to manufacture them. For instance, the production of farming tools, fertilizer, corn transportation, ethanol distillation, and the process of cultivating corn for ethanol all depend on fossil fuels. Accordingly, ethanol made from corn only contributes a small amount of energy; sugarcane and cellulosic ethanol or algae biodiesel may contribute even more energy.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

Authors declare no conflict of interest

Received:	03-October-2022	**Manuscript No:**	IPACRH-22-15172
Editor assigned:	05-October-2022	**PreQC No:**	IPACRH-22-15172 (PQ)
Reviewed:	19-October-2022	**QC No:**	IPACRH-22-15172
Revised:	24-October-2022	**Manuscript No:**	IPACRH-22-15172 (R)
Published:	31-October-2022	**DOI:**	10.21767/2572-4657.6.5.22

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Citation Matthew P (2022) The Chemistry behind the Biofuels and its Positive Effects on the Environment. Arch Chem Res. 6:22.