



Economic Review and Environmental Benefits of Bioethanol

Rozita Kaviani^{a, *}

^a Department of Chemical engineering, Shiraz Branch, Islamic Azad University, Shiraz, Iran

ARTICLE INFO

Article history:

Received

Received in revised form

Accepted

Available online

Keywords:

Environmental

Economic

Ethanol

Fuel

ABSTRACT

In recent years, much attention has been paid to the conversion of biomass to bioethanol. Biological energies are renewable fuels with minimal pollution and play an important role in reducing greenhouse gas pollution. One of them is bioethanol, which is obtained from fermentation operations. The world's attention to the use of it as an energy source is focused on reducing the cost of production and increasing the efficiency of the ethanol industry. Ethanol or ordinary alcohol with the formula C_2H_5-OH can be used with cheap or inexpensive cellulosic sources, Such as straw, wood chips, agricultural residues, or relatively valuable carbon sources such as sugar beet molasses or sugarcane molasses, or quite valuable carbon sources such as sugar and starch. Agricultural waste is mainly composed of cellulose. In this paper, while introducing the sources of bioethanol production, its economic and environmental justification is used and its use as a green fuel in cars is discussed.

1. Introduction

Ethanol can now be considered as a reliable source of fuel. Ethanol can be produced in any country according to the resources of that country [1]. For example, in Iran they get molasses, in the United States from corn, in Europe from potatoes and ... ethanol [2]. Oil and its related products cause a lot of damage to the environment and human health [3], and the treatment of diseases requires a lot of money, which harms the country's economy [4]. Despite the fact that factories and power plants are very few in number and their operation is very easy to control, but the number of cars in the world that use oil and gasoline fuels is very large and it is impossible to control them, while the means of transportation. The main cause of greenhouse gases and their dispersion in space [5].

Researchers, while studying these problems, the only possible solution is to reduce human dependence on oil and its products. It may have been a dream one day, but scientists have been using ethanol instead of fuel in cars for some time [6]. The combination of ethanol with oil in car fuel tanks helps reduce air pollution, but the main problem with this fuel is its high price. Ethanol is currently sold at a very high price, and if different countries decide to implement this plan, a lot of subsidies should be given to ethanol so that people can use it as well

[7]. By consuming ethanol fuel instead of fossil fuels, the amount of greenhouse gas emissions known to be the cause of global warming is somewhat reduced. Ethanol can be obtained from wheat, sugar, palm oil, or even edible oils obtained from fast food restaurants [8]. Access to reliable energy sources is the most important challenge facing the countries of the world in the coming decades [9]. Due to the alarming situation in the country in the field of fuel supply of cars, which in addition to the need for continuous economic measures, has caused serious environmental problems on the one hand, and a huge and unprecedented volume of research and studies in various fields. In other countries, in order to use ethanol as a fuel for cars, it is underway [10-15].

On the other hand, it is necessary to consider national measures as soon as possible with the aim of reviewing and replacing gasoline with ethanol [16].

2. Sources of alcohol production

Currently, more than 98% of the ethanol produced in the world is obtained by the method of fermentation of sugars [17]. The sugar used can be extracted from various sources such as starches, sugars, agriculture, industrial effluents and lignocellulosic sources [18]. The cost of ethanol production is highly sensitive to the price of raw materials, the cost of delivering it to the process

* Corresponding author. e-mail: rozita.kaviani@gmail.com