Synthetic Alcohol Not Yet Needed

Chemistry

Low Molasses Tariff Prevents Change of Process

CONGRESS has decided not to force the synthetic manufacture of alcohol in this country by means of a prohibitive tariff on blackstrap molasses, formerly used for making rum but now the chief source of industrial alcohol.

In spite of efforts of certain senators and representatives from the agricultural districts, among which was Senator Brookhart of Iowa, to boost the rate on Cuban blackstrap molasses to a figure such as eight or five cents per gallon, the rate has been raised only from one-sixth cent to one-third cent.

The surplus corn crop of Iowa and other corn-belt states has been the motivating factor behind the efforts of Senator Brookhart and others to raise the blackstrap rate. It was held that corn sugar might just as well be used for the production of industrial alcohol.

Those who opposed this theory declared that it would be too expensive to use corn for this purpose and pointed out costs of rail transportation from the corn belt to coast-situated industrial alcohol factories. Instead of using corn, these factories would turn to the synthetic process of making alcohol as is done in Germany, it was said.

Numerous processes are known by which alcohol can be made from coal, lignite, petroleum or natural gas.

While the synthetic process was being developed, however, opponents of the high molasses tariff declared users of industrial alcohol would be subjected to such high costs (under an eight or five cent tax) that the 25,000 manufacturers of cosmetics, perfumes, paints, varnishes, lacquers, artificial silk, and many other substances, would be hamstrung in their industrial expansion.

A recent monograph published by the Bureau of Prohibition of the Treasury Department pointed out that grain alcohol costs 10 to 15 cents more per gallon to manufacture than molasses alcohol.

This publication pointed out that it was only during the World War and since then that the United States has so greatly expanded in the use of industrial alcohol. Many dyes, pharmaceuticals, and chemical specialties formerly obtained from Germany are now manufactured at home, the Prohibition Bureau explains. The use of industrial alcohol in this country has risen from one million gallons per year in 1906 to one hundred times that amount or 100,000,000 gallons at the present time.

"Cheap industrial alcohol is absolutely essential to an active chemical industry that may successfully compete in the world market," the statement reads.

It is now known that during the past year the Treasury Department of the United States granted a temporary permit to a chemical corporation to experiment with the process of making synthetic ethyl alcohol from ethylene. The experiment was so successful, it is understood, that only the possible problem of reducing costs of manufacture remains to be solved. The Treasury Department comments on the experiment, stating that "if the cost of production is no greater than the fermentation processes now being used, the quantity that can be produced is only limited by the quantity of coal and petroleum oils available."

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Plants See Without Eyes

Biology-Physics

ALTHOUGH plants have no eyes to see with, they can distinguish between different colors of light, and they paradoxically indicate their choice by bending toward the radiation that they find hardest on their growth. This preference by plant protoplasm is being explored by scientists at the Smithsonian Institution in Washington, as a part of a program of research on the influence of radiation on living things sponsored by Dr. Charles G. Abbot, secretary of the Institution.

The group immediately concerned with the work is led by Dr. F. S. Brackett, physicist, and Dr. E. S. Johnston, plant physiologist. In one of the laboratory rooms they have arranged a dark chamber with an electric lamp at either end, its light passing through a color screen. A young plant is placed between the two, at a point where the energy of the opposing light-beams has been instrumentally determined as being exactly equal.

The plant thus finds itself in the position of the donkey exactly midway between two haystacks, which medieval philosophers are said to have argued about. Which will it choose? The way out of the dilemma is as though the donkey had found himself between a stack of timothy hay and one of clover: there is a qualitative choice. All kinds of visible lights seem to have a retarding effect on plant growth, but some have more than others; and the plant grows less on the side exposed to the more growth-retarding of the two beams, and therefore grows toward it, being pushed over by its more rapidly-growing side.

Red light, and the short-wave infra-red, the Smithsonian experiments have shown, have very little effect on growth. Yellow light still has little effect, though more than red. But the green sector of the spectrum has a powerful influence, and the blue-violet group of wavelengths are stronger still in causing growing plant-tips to bend.

The work, Dr. Brackett informed Science Service, is still in its preliminary stages, and only broad groups of wavelengths have so far been used. Apparatus is now being made that will enable the experimenters to split white light up into much more finely subdivided individual beams, and thereby make possible a much more exact test of the effect of each separate wavelength throughout the spectrum.

The research on the color likes and dislikes of growing plants is only a small part of the work projected by the Smithsonian Institution. Eventually the experimenters hope to get at some of the secrets of the mechanism by which the chlorophyll of green leaves uses sunlight to combine carbon dioxide and water to make sugar. But the barest beginnings of an understanding of the structure of these complex living molecules have yet to be worked out.

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