

Ethanol*

Pre-reading

Questions: What do you know about this topic? What would you like to know?

Definitions: Ferment – to cause a chemical change

Green house emissions – gases that contribute to the trapping of the sun's radiation in the earth's atmosphere.



Reading

Ethanol is a clear, colorless alcohol fuel made from the sugars found in grains such as corn, sorghum, and wheat. It is a renewable fuel because it is made from plants. Corn is the main ingredient for ethanol in the United States. It is low in price and great in abundance.

Most ethanol plants are located in the Midwest and South where there is a large supply of corn. At the plants, the starch from the corn is fermented into sugar. The sugar is then fermented into alcohol. Other crops such as barley, wheat, rice, sorghum, sunflowers, potatoes, sugar cane and sugar beets can also be used to produce ethanol.

Sugar cane and sugar beets are the most common ingredients for ethanol in other parts of the world. Since alcohol is created by fermenting sugar, sugar crops are the easiest ingredients to convert into alcohol. Brazil, the country with the world's largest ethanol production, makes most of its ethanol this way. Today, many cars in Brazil operate on ethanol made from sugar cane.

As a transportation fuel, ethanol can be used as a total or partial replacement for gasoline. Gasoline containing ten percent ethanol, E10, is used in many urban areas that don't meet clean air standards.

Some states promote more widespread use of E10. Minnesota, for example, requires almost all gasoline sold in the state to contain 10 percent ethanol. All vehicles that run on gasoline can use E10 without making changes to their engines.

E85 is an alternative fuel that is 85 percent ethanol and 15 percent gasoline. E85 is used mainly in the Midwest and South. Vehicles are not modified to run on E85; they are specifically manufactured as "flexible fuel vehicles." These types of vehicles can use any mixture of ethanol and gasoline up to E85.

Using ethanol means that we use a little bit less gasoline, which is a nonrenewable fuel. Unlike gasoline, ethanol is nontoxic, which means it is safe to handle. It is also biodegradable; it quickly breaks down into harmless substances if spilled.

When small amounts of ethanol are added to gasoline, usually less than 10 percent, there are many advantages. Ethanol makes the air cleaner. It reduces carbon monoxide and other toxic pollution from the tailpipes of vehicles.

Ethanol keeps engines running smoothly without the need for lead or other chemical additives. Because ethanol is made from crops that absorb carbon dioxide and give off oxygen, it helps reduce green house emissions. This carbon cycle maintains the balance of carbon dioxide in the atmosphere when using ethanol as a fuel.

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Understanding

1. What does the word toxic mean? What kind of fuel is toxic? _____

2. From what can ethanol made? (List at least five sources.) _____

3. What do E10 and E85 mean? Could my car use either type? _____

4. How is ethanol produced? Describe the process. _____

5. What are the benefits of ethanol? (List at least three.) _____

6. How prevalent is ethanol use? _____

7. Who is the world leader in ethanol production? Why? _____

Writing

Option A: Summarize the reading in your own words.

Option B: Do you use ethanol? Why or why not? What impact could ethanol have on a local economy? Is it produced in your area? If yes, where is the plant?
