

Where Does That Oil Go?

Directions: Read the following story and answer the questions on the next page.

Once the oil comes in, the well is capped and equipment is installed to control the flow, and to separate the crude oil from the natural gas. Prudhoe Bay, on the Arctic coast of Alaska, is ice-bound most of the year. So, the oil must run a long route to market. From the wells, the crude oil moves through small pipelines to the big trans-Alaska pipeline. There it begins the 800-mile journey to Valdez, where it is loaded on tankers for shipment Outside.

Once the oil reaches the lower 48, modern plants and refineries process the oil and natural gas into gasoline, jet fuel, heating oil, diesel, liquified gas and fertilizer. And those are just a few of the products that can be made from petroleum. Petrochemicals (chemicals made from oil and gas) are used as a base for a wide assortment of things, from plastics to vitamins to records, detergents, movie films, fabrics, and antifreeze.

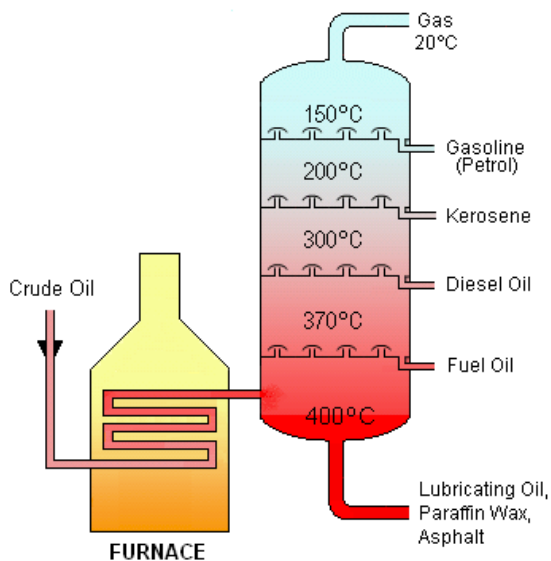
This strange stuff we call petroleum is made up almost entirely of only two elements—hydrogen, a gas-like element that will burn; and carbon, a chemical element that is found in all living matter. If you really want to sound like a pro, you can use the scientific word for petroleum, which is “hydrocarbons.” These hydrocarbons are present in thousands of different combinations that can be separated and purified in the process called “refining.”

The first step in refining is to sort out the major “fractions” or parts of the hydrocarbons that make up crude oil. These fractions boil and vaporize (like steam) at different temperatures. So the simplest form of refining works like this:

- a. The crude oil is heated in a furnace and the vapor is piped into a tall refinery tower.
- b. Hot steam is pumped in below to speed up the process.
- c. The vapors from the different fractions rise, cool off and condense (turn back into liquid) at different levels.
- d. There they are drawn off and collected for further processing if necessary.

REVIEW:

1. Where does the oil from Prudhoe Bay go?
2. Define petrochemicals.
3. What are the major elements that make up petroleum
4. Here is a drawing of a refinery tower that shows at which points the different products are drawn off and collected.
 - a) Which fractions of oil are collected at the lowest temperatures?
 - b) Which fractions of oil require the highest temperatures to fractionate?
 - c) At what approximate temperature can you separate out gasoline?



Source Theresa Knott (Wikipedia Commons)

Suggested Answers:

- 1. down the pipeline to Valdez and onto tankers for shipment outside*
- 2. chemicals made from oil and gas*
- 3. hydrogen and carbon*
- 4. a) Gases*
b) lubricating oil, paraffin wax, asphalt
c) 150C