НИ (англ.):622.276

FOR WHAT PURPOSE IS PETROLEUM PRODUCED?

Ledkova A.O., Ledkov A.O., Tsigankova E.V.
Scientific supervisor – Associate professor Tsigankova E.V.

Siberian Federal University

Petroleum is one of the great servants of mankind. Petroleum is often called crude oil, or oil. It is called a fossil fuel because it was formed from the remains of tiny sea plants and animals that died millions of years ago. When the plants and animals died, they sank to the bottom of the oceans. Here, they were buried by thousands of feet of sand and sediment, which turned into sedimentary rock. As the layers increased, they pressed harder and harder on the decayed remains at the bottom. The heat and pressure changed the remains, and eventually, petroleum was formed. Petroleum deposits are locked in porous rocks almost like water is trapped in a wet sponge. When crude oil comes out of the ground, it can be as thin as water or as thick as tar. Petroleum is called a nonrenewable energy source because it takes millions of years to form. We cannot make new petroleum reserves.

Petroleum is composed of various complex combinations of hydrogen and carbon atoms. These combinations are called hydrocarbons. Hydrocarbons are immiscible in water; that is, the hydrocarbons will not readily mix with water. Oftentimes the hydrocarbons found in nature are not pure substances. They may (and usually do) have other elements and compounds associated with them, such as sulfur, carbon dioxide, water, and nitrogen. It was formed millions of years ago from the remains of animals and plants, which lived in the seas.

Petroleum is pretty easy to identify whether you find it in nature or observe is composition at the molecular level. It is a thick oil that is black or very dark brown in color. Conventional oil is found with a lighter layer of gas above it and a heavier layer of water below it. There is also heavy crude, which is mixed with sand and has an incredibly thick consistency. Petroleum, when examined closely, is made up mostly of carbon with a small amount of hydrogen and trace amounts of nitrogen, oxygen and sulfur.

Crude oil, or simply oil, may vary in consistency from a very light, thin liquid like motor gasoline to a very heavy, thick liquid such as asphalt. In color, the crude oil may be as clear as water or any combination of yellow, green, brown, or black. Most (but not all) liquid petroleum weighs less than water. Therefore, most oil floats on water. Oils that are close to the same weight as water, or oils that are heavier than water, are called heavy oils. We can't use crude oil as it comes out of the ground. We must change it into fuels that we can use. The first stop for crude oil is at an oil refinery. A refinery is a factory that processes oil. The refinery cleans and separates the crude oil into many fuels and products. The main use for petroleum is to make fuel. Light petroleum, which has less carbon and more hydrogen, is the perfect type for this. Gasoline, diesel and all other major sources of fuel are derived from petroleum. While this is the most popular use for the oil, it also is mined for other reasons.

Here are some examples of what can be obtained from petroleum (crude oil, natural gas, and viscous or solid forms):

- Fuels - like gasoline, diesel, propane (many people use propane to heat their homes), heating oil
- Heavy bottoms - like asphalt, bitumen, tar
- Petrochemicals - used as a feedstock for many everyday products:
  - plastic gadgets, tools, bags, toys;
  - candles;

- clothing (polyester, nylon), tennis shoes;
- hand lotions, petroleum jelly;
- perfume, dishwashing liquids, ink;
- bubble gums;
- car tires, heart valves;
- ammonia and many more.

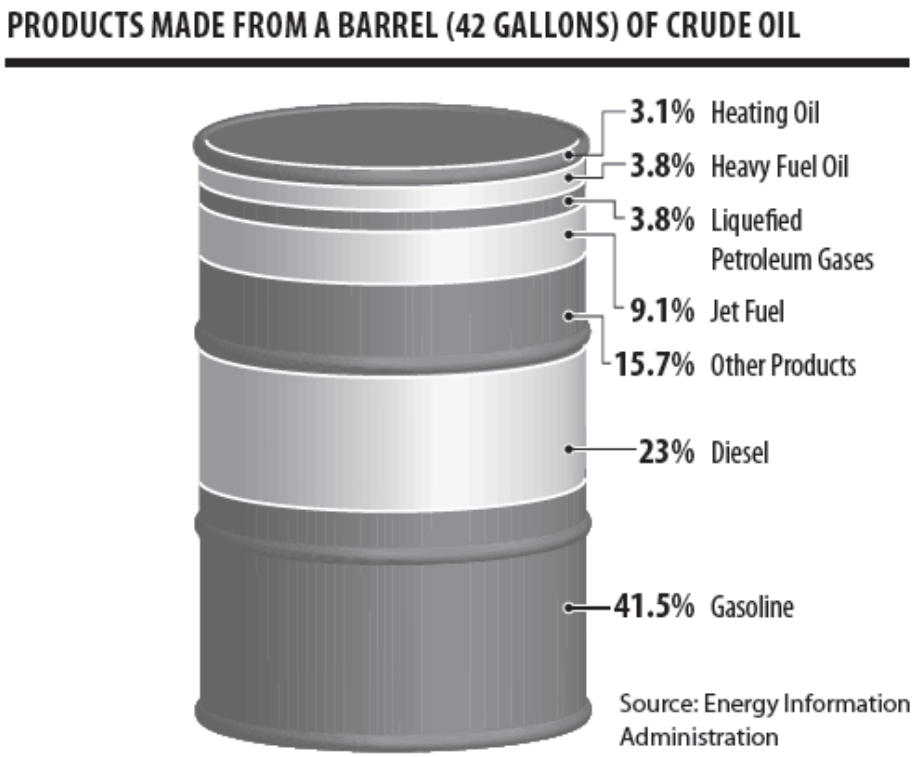

Figure 1 – Products of crude oil

The use of petroleum spread slowly in what has been called the "kerosene age" (1859-1900), but the development of the internal-combustion engine, near the beginning of the twentieth century, set off a phenomenal growth of the petroleum industry, a growth that has not yet shown any sign of slackening. We are now in what might be called the "gasoline age," for gasoline is the chief product now being derived from petroleum. More than half of the national supply of energy in the United States is furnished by gasoline, natural gas, and other petroleum products, and the use of petroleum as a source of energy is increasing rapidly in other parts of the world as well.

Petroleum products-gasoline, medicines, fertilizers, and others- have helped people all over the world. But there is a trade-off. Petroleum production and petroleum products may cause air and water pollution and the exploration of oil and gas.

Drilling for and transporting oil can endanger wildlife and the environment if it spills into rivers or oceans. Leaking underground storage tanks can pollute groundwater and create noxious fumes. Processing oil at the refinery can contribute to air and water pollution. Burning gasoline to fuel our cars contributes to air pollution. Even the careless disposal of waste oil drained from the family car can pollute rivers and lakes.

The petroleum industry works hard to protect the environment. Gasoline and diesel fuel have been changed to burn cleaner. And oil companies' work to make sure that they drill and transport oil as safely as possible.

Oil - is a priceless treasure of humanity. Therefore, our task is competent and prudent use of this gift.