Gasoline

Gasoline is a liquid used to fuel many types of vehicles. It is necessary for many people around the world to travel or even to just go back and forth from school or a job. Gasoline is known as a fossil fuel. Fossil fuels are formed from the remains of dead plants and animals which have decayed and have been converted into oils because of the heat and pressure inside the crust of the Earth. These oils from decayed plants and animals are made up of molecules called hydrocarbons. Hydrocarbons are made up of hydrogen and carbon atoms from living things. This means hydrocarbons are called organic molecules.

The oil from the Earth is called crude oil and is used to create gasoline. Crude oil is pumped up from the ground. The oil has different types of hydrocarbons in it. The hydrocarbons have chemical structures which are shaped like chains. These different sizes of chains have special properties. Shorter hydrocarbon chains, such as methane (CH_4), are found in the gaseous state while longer hydrocarbon chains, octane (C_8H_{18}) can be found as a liquid. Hydrocarbons are named based on their chain size and numbers of carbon and hydrogen atoms.

Gasoline is a mixture of liquid state hydrocarbon molecules. An important part of gasoline is called octane. When gasoline is used in a vehicle it needs to be able to ignite and then be used to help a vehicle's engine work. In engines, gasoline and air are mixed together and are under pressure. This high pressure can cause the gasoline and air mixture to burn too fast instead of burning smoothly, making something called an engine knock. Engine knock is a rattling or pinging noise that comes out of a cylinder in an engine.

At gas stations around the country there is a number on gas pumps ranging from 0 to 100. This number, called the octane number, tells how the fuel will burn. A higher number means that the fuel will burn smoother. When the octane number is 100, this means it is made up of pure iso-octane (2,2,4 trimethyl pentane). This chemical is called iso-octane because it has branches coming off its chemical structure but is still made up of the same number of carbon and hydrogen atoms as octane. When the octane number is 0, it is purely made up of heptane (C_7H_{16}) which is a compound with no branches and creates bad engine knock.