

Answer on Question #54500 – Chemistry – General chemistry

Question:

What type of matter are soda, coffee, water, salt water, water vapor, alloy, salt water and gasoline?

Answer:

Everything in this world is either matter or energy. Matter is anything that has weight and takes up space. There are three types of matter: solids, liquids and gases. All types of matter are made up of molecules - tiny building blocks of all solids, liquids and gases.

Like most substances, water exists in three distinct forms or phases: solid ice, liquid water, and gaseous steam. These phases differ in how easily their shapes and volumes can be changed. Solid ice is rigid and incompressible, preventing we can from altering an ice cube's shape or volume. Liquid water is an incompressible fluid, so that we can reshape a water drop but can't change its volume. Gaseous steam is a compressible fluid, so that we can vary both the shape and volume of the steam in a teakettle. These different characteristics reflect the different microscopic structures of steam, water, and ice. Steam is a gas, a collection of independent molecules that is also called water vapor. These water molecules bounce around their container, periodically colliding with one another or with the walls. The water molecules fill the container uniformly and easily accommodate any changes in its shape or size. Enlarging the container simply decreases the steam's density and lowers its pressure.

Thus, the water is compound matter. It is also liquid type of the matter. Liquids are a form of matter that has a definite volume but no defined shape.

Salt water is a homogeneous mixture. Salt dissolves completely in water and dissociates in to sodium and chloride ions. The salt solution is clear and transparent and salt cannot be separated from water by filtration. Salt can be separated only by evaporation of water and water can be collected by condensing the steam generated.

Vapor refers to a gas phase at a temperature where the same substance can also exist in the liquid or solid state.

Alloy is the mixture (homogeneous mixture) type of matter (Mixture of solid metal elements and liquid or unstable metal elements like quicksilver made from mercury and silver). Alloys can be a combination of metals and non-metals. Various combinations of metals can create different alloys which show different chemical and physical properties. The constituent metals of alloy cannot be separated by physical processes.

A sample of pure baking soda, regardless of its source or size, will be white solid containing 57.1% sodium, 1.2% hydrogen, 14.3% carbon, and 27.4% oxygen. The sample will

dissolve in water. When heated to 270°C the sample will decompose, giving off carbon dioxide and water vapor and leaving a residue of sodium carbonate. Thus, by definition, baking soda is a pure substance because it has a constant composition and a unique set of properties.

Coffee is the liquid type of the matter.

Gasoline is the liquid type of matter.

A physical change is one in which the form or appearance of matter changes, but not its composition. Although the water changes state due to a change in temperature, it is still made of the elements hydrogen and oxygen.