Resource: Chemical Properties of Matter

Chemical Property Facts for Kids

In chemistry, a **property** is any aspect of a substance which is only seen by means of a chemical reaction. Simply speaking, chemical properties cannot be determined just by viewing or touching the substance. This is different from a physical property, which can be discovered without changing the substance's chemical structure.

Usually a chemical property is discovered by changing the substance's internal structure. When a substance goes under a chemical reaction, the properties will change drastically, resulting in a chemical change. However, a catalytic property would also be a chemical property.

Chemical properties can be used for building chemical classifications. They can be used to identify an unknown substance or to separate or purify it from other substances.

Chemical Reactions

A chemical reaction happens when one or more chemicals are changed into one or more other chemicals. Examples:

- Iron and oxygen combining to make rust
- Vinegar and baking soda combining to make sodium acetate, carbon dioxide and water
- Things burning or exploding
- Many reactions that happen inside living things
- Electrochemical reactions when discharging or re-charging batteries

Some reactions are fast, and others are slow. Some happen at different speeds, depending on temperature or other things. For example, wood does not react with air when it is cold, but if it is made hot enough, it will start to burn. Some reactions give out energy. These are exothermic reactions. In other reactions, energy is taken in. these are endothermic reactions.

Nuclear reactions are not chemical reactions. Chemical reactions involve only the electrons of atoms; nuclear reactions involve the protons and neutrons in the atomic nuclei.

Four Basic Types of Chemical Reactions

Synthesis: two or more simple substances combine to form a more complex substance.
Decomposition: more complex substance breaks down into its more simple parts. (opposite of synthesis)
Single Replacement: single uncombined element replaces another in a compound
Double Replacement: anions and cations of two compounds switch places and form two entirely different compounds

Example of Chemical Properties

- Reactivity with other chemicals
- Toxicity
- Coordination number
- Flammability
- Enthalpy of formation
- Heat of combustion
- Oxidation states
- Chemical stability

Physical Properties

A physical property is a property, quality, or way that an object is. A physical property can always be measured without changing or making the object chemically different or different in a way that would affect its chemical or atomic structure. There are two types of physical properties: intensive and extensive.

Intensive physical properties do not depend on how much of the object there is. For example, a small rock will be just as hard as a large rock. Hardness, softness, and seed (quickness) are intensive physical properties.

Extensive physical properties change depending on how much of the object there is. For example, a small rock weighs less than a large rock. Volume, total mass, and weight are extensive physical properties.

Physical properties also include when a physical change occurs.

Catalysis Facts for Kids

Catalysis is the change in speed of a chemical reaction due to the help of a catalyst. Unlike other chemicals which take part in the reaction, a catalyst is not consumed by the reaction itself. A catalyst may participate in many chemical reactions. Catalysts that speed the reaction are called positive catalysts. Catalysts that slow the reaction are called negative catalysts, or inhibitors. Substances that increase the activity of catalysts are called promoters, and substances that deactivate catalysts are called catalytic poisons.

A catalyst is something which changes the rate of a chemical reaction. An example is when manganese oxide is added to hydrogen peroxide and the hydrogen peroxide starts to break up into water and oxygen.