5.1

Chemicals and Chemical Change

Intro:

Chemistry is the study of matter

Matter is anything that has mass and takes up space

Matter can be classified either in two ways:

1. Pure Substance
2. Mixture

Pure Substances contain only one type of particle and can be classified in two ways:

1. Elements – can not be broken down into a simpler substance and are found on the periodic table. 🡪 carbon, hydrogen, calcium
2. Compounds – contain two or more different elements in a fixed proportion. 🡪 water H2O, Carbon monoxide CO

Mixtures contain at least two different pure substances or two different types of particles. Mixtures can be classified in two ways:

1. Homogeneous mixture (Solution) – May be made of liquids, solids or gases. The particles mix well with one another and you can see only one phase or visible part. 🡪 soft drink
2. Heterogeneous mixture – the particles do not mix well with one another and you see more than one phase or visible part. 🡪 pizza

Create a flow chart for the organization of matter, pure substances and mixtures

Matter

Pure Substance Mixtures

Compounds Elements Homogeneous Mixture Heterogeneous Mixture

|  |  |  |  |
| --- | --- | --- | --- |
| **Matter** Anything with mass and volume. | | | |
| **Substance**  Matter with constant composition | | **Mixture** Matter with variable composition | |
| **Element** Substance made up of only one type of atom | **Compound** Two or more elements that are chemically combined | **Heterogeneous Mixture** Mixtures that are made up of more than one phase | **Homogeneous Mixtures** Also called solutions.  Mixtures that are made up of only one phase |
| **Examples -** gold, silver, carbon, oxygen and hydrogen | **Examples -** water, carbon dioxide, sodium bicarbonate, carbon monoxide | **Examples -** sand, soil, chicken soup, pizza, chocolate chip cookies. | **Examples -** salt water, pure air, metal alloys, seltzer water. |

<http://www.fordhamprep.com/gcurran/sho/sho/review/rev14b.htm> test yourself!!

Properties of Matter

All matter has Physical and Chemical properties

A physical property is a characteristic of a substance –

1. Hardness
2. Melting
3. Boiling points
4. Odor
5. Solubility
6. Color
7. Viscosity
8. State of matter

A physical change is when the substance involved remains the same chemically, but changes state or form. Example: water freezing, others… Remember: most physical changes are easy to reverse.

A chemical property is a characteristic behavior that occurs when a substance changes to a new substance. Example: Flamability others…

Chemical change is the change itself. It always involves the production of new substances and are difficult to reverse. Examples: burning, cooking, rusting

The starting materials are called reactants and the new materials produced are called products.

REACTANTS 🡪 PRODUCTS

Chemical or Physical? How do you tell?

Clues that a chemical change has occurred:

1. Color change
2. Energy change – HEAT / LIGHT are given off. Temperature decreases or increase
3. Odor Change – Bubbles of gas are formed
4. The change is difficult to reverse
5. State change – solid 🡨🡪 liquid 🡨🡪 gas

<http://videos.howstuffworks.com/hsw/8685-states-of-matter-chemical-changes-video.htm>

Read section 5.1 pages 172 – 175

Complete Understanding Concepts 1-8