HW 1

HW1

- In chemical transformations (called chemical reactions), substances change into different substances. In physical transformations, substances do not change into new ones.
- Substances are made of atoms. Atoms come together to form molecules.
- Molecules are the building blocks of substances, controlling their properties.
- Atoms are the basic units of molecules.
- Element - Contains just one type of atom and cannot be reduced to smaller components by any non-nuclear chemical reaction. We cannot break the element down any further and still call it that element.
- Compound - Is a chemical substance whose molecules are made of atoms from more than one element.
- A mixture - contains two or more different substances that are not chemically bonded together. Pure substances can be separated from mixtures.

A few rules for determining how to classify a substance:

- A substance is an element if you can find it on the periodic table. For example, iron is an element with the symbol Fe (atomic number 26).
- If there is a chemical formula for a substance, it is a compound. For example, sodium chloride is a compound with the formula NaCl.
- You can separate components of a mixture, but you cannot do it for a pure substance.
- A substance that is approximately uniform in all directions is a homogeneous mixture – also called a solution. For example, tea is a solution.
- A heterogeneous mixture has some non-uniformity. For example, a rock is a mixture of different minerals. You can see the grains in the rock.

Questions:

1. Imagine you turn a) stone into sand, b) oxygen to ozone, c) ice to vapor – in what case do you do a chemical transformation (chemical reaction)? What happens when we burn a candle – physical or chemical transformation?
2. State whether each substance below is an element, compound, homogeneous, or heterogeneous mixture: gold, water, concrete, neon (Ne), seawater, carbon monoxide (CO), iron, sodium chloride (table salt, NaCl), granite, sweet tea.