

## HW 1

- 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 get together to form **molecules**
- **Molecules** are building blocks of substances controlling their properties
- **Atoms** are the basic units of molecules
- **Element** - Contains just one type of atoms and cannot be reduced to smaller components by any non-nuclear chemical reaction. we cannot break the element any further and still call it this element
- **Compound** - Is a chemical substance, which molecules are made of atoms from more than one element
- **A mixture** - contains two or more different substances that are not joined 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 (number 26).
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- If there is a chemical formula for a substance, it is a compound. For example, sodium chloride is a compound with the formula NaCl.
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- You can separate components of a mixture, you cannot do it for a pure substance.
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- A substance that is approximately uniform in all directions is a homogeneous mixture – also called a solution. For example, tea is a solution.
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- 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.

