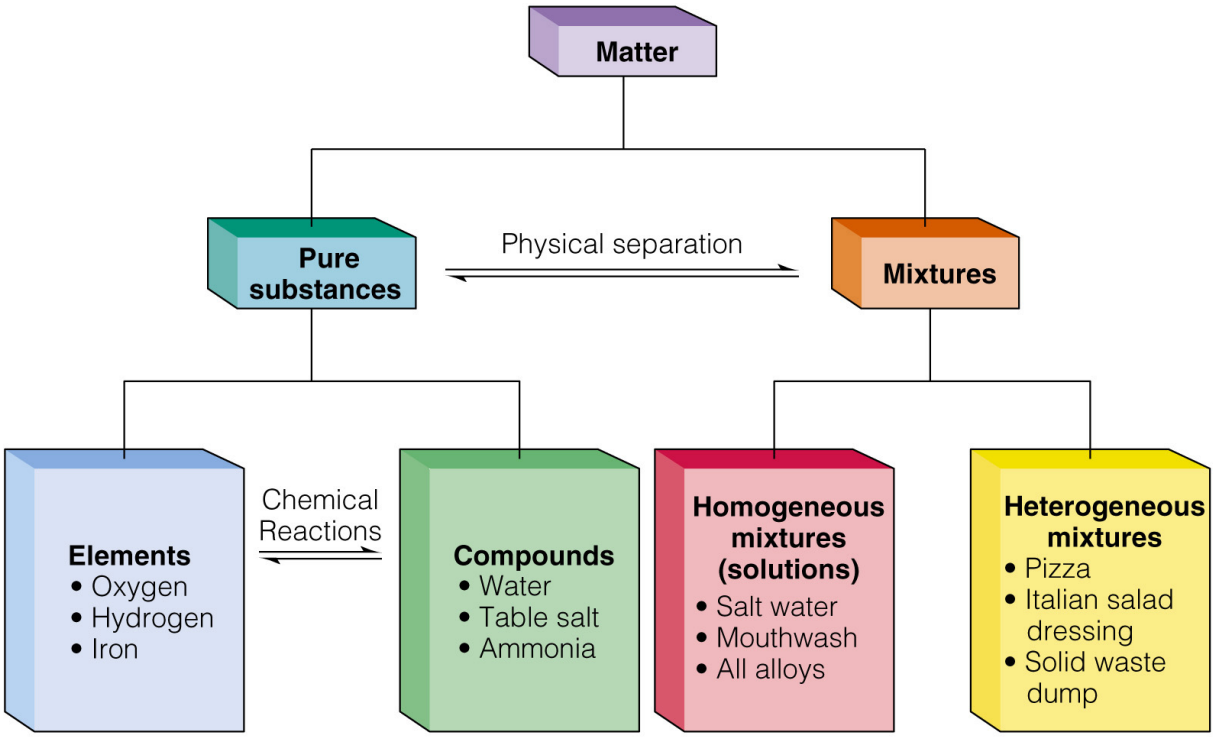
Matter
Pure substances
Physical separation
Mixtures
Elements
• Oxygen
• Hydrogen
• Iron
Chemical Reactions
Compounds
• Water
• Table salt
• Ammonia
Homogeneous mixtures (solutions)
• Salt water
• Mouthwash
• All alloys
Heterogeneous mixtures
• Pizza
• Italian salad dressing
• Solid waste dump

Chemical Changes

The new substance formed has totally different properties and composition than substances present before reaction

Example: $2Na + Cl_2 \rightarrow 2NaCl$

Reactants ------> Products

Applying the Law of Conservation of Mass

$Mass_{Reactants} = Mass_{Products}$

.7 $Mg\ O_2$

Example:

In an experiment, 10.00 g of red mercury(II) oxide powder is placed in an open flask and heated until it is converted to liquid mercury and oxygen gas. The liquid mercury has a mass of 9.26 g. What is the mass of oxygen formed in the reaction?

10.00g = 9.26g + X

-9.26g -9.26g

mercury(II) oxide → mercury + oxygen gas

$2HgO \rightarrow 2Hg + O_2$

Elements and Compounds

Pure substance that cannot be separated into simpler substances by physical or chemical means.

Made of 1 type of atom

Ex: Cu, O_2, Au

O_3

Pure substance that can be separated into simpler substances by chemical means only.

Made of more than 1 type of atom.

Ex: H_2O, NaCl, HgO

2:1 1:1 1:1

Law of Definite Proportions

Compounds are always composed of the same elements in the same proportion by mass.

% By Mass = Mass of element / Mass of compound x 100

Example:

A 78.0 g sample of an unknown compound contains 12.4 g of hydrogen. What is the percent by mass of the hydrogen in the compound?

$\frac{12.4\,g}{78.0\,g} = 15.89\% = 15.9\%$