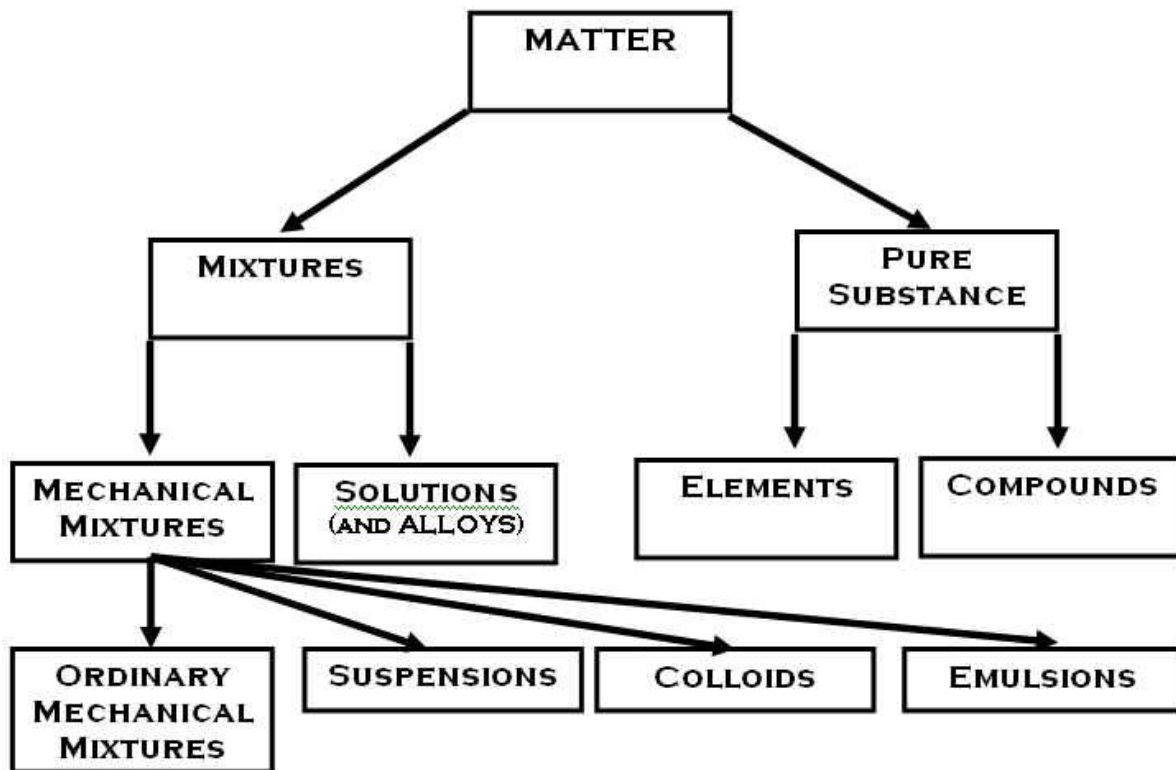


5.2 + 5.3 Classifying Matter



Natural substance : found in nature

Synthetic substance: invented or produced by humans in labs (not naturally occurring)

Pure Substances

Pure Substance: a substance that consists of only one type of particle (only one type of atom or molecule in the substance).

Elements are pure substances that consist of only one type of atom.
Examples of elements: Gold, Carbon, Chlorine, Oxygen.

Compounds are pure substances that consist of molecules of two or more types of atoms in fixed ratios.
Examples of Compounds: Carbon Dioxide (CO₂), Sugar (C₆H₁₂O₆)

Mixtures

Mixture: a substance that contains two or more pure substances mixed but not always in the same ratio. Mixtures make up most of the matter in the world. Mixtures may be either “solutions” or “mechanical mixtures”.

Properties of Mixtures:

- Each substance retains all its own chemical properties.
- The substances that make a mixture can be present in any amount.
- The substances in a mixture can be separated by simple physical means (i.e. Salt + water: boil off the liquid part of the mixture).

Types of mixtures:

- **Homogeneous Mixture:** a mixture that IS uniform throughout (the appearance and properties of the substance are uniform). It looks the same throughout the mixture (example: solutions and alloys).
- **Heterogeneous Mixture:** a mixture that is NOT uniform throughout. It does not look the same throughout the mixture (example: metal ores).

SOLUTION: a homogeneous substance made of more than one kind of particle in which the particles ARE uniformly scattered.

Solutions have two main traits:

- (a) the particles in the mixture are too small to see
- (b) the particles in the mixture are evenly distributed

Solvent : the substance that dissolves a solute to form a solution.

Solute : the substance that dissolves in the solvent.

All solutions retain properties from both the solvent and solute.
(example: salt in water – looks like water, tastes like salt)

Alloys: important metal solutions which are homogeneous mixtures of two or more metals (example: a “nickel” coin is made from 75% copper -25% nickel and Bronze is a mixture of 20% tin and 80% copper).

MECHANICAL MIXTURE: a substance made of more than one kind of particle in which the particles are not uniformly scattered (heterogeneous).

Ordinary Mechanical Mixture : a substance made of different parts big enough to see and they stay mixed (example: granite rock).

Suspension: a substance made of a liquid or gas with small particles that are distributed throughout but will separate into layers (because of gravity) if left undisturbed (example: Milk of Magnesia, or muddy water).

Colloid: a substance made of a liquid or gas with small particles suspended in it. These particles are so small that gravity does not cause them to completely separate (example: whipped cream).

Emulsion: A mixture of two normally unmixable liquids (like oil and water) in which one is liquid is suspended in the other (one exists as tiny particles within the other).

When a beam of light is directed through a mixture, if the light is scattered by the particles in the mixture, then the mixture is a colloid and NOT a solution. This scattering of light by the particles in a colloid mixture is known as *the Tyndall effect*.

Summary of Mixtures

	Homogeneous	Heterogeneous
Liquid with a Liquid	SOLUTION	EMULSION
Liquid with a Solid	SOLUTION	SUSPENSION or COLLOID
Solid with a Solid	ALLOY	MECHANICAL MIXTURE

Downloaded from: <http://www.tvdsb.on.ca/saunders/courses/SNC1D/chemistry/index.htm>