

Chapter 4 Notes: Elements Compounds and Mixtures

Pure Substance: A substance in which there is only one type of particle.

There are two types of pure substances.

1. Elements: A pure substance that cannot be separated into simpler substances by physical or chemical means. This is a single kind of atom.
2. Compounds: A pure substance composed of two or more chemically combined elements. These can be separated or broken down into elements by chemical -not physical- changes.

Elements are classified into categories according to groups of similar properties. The three major categories of elements are:

- a. Metals - Are shiny, good conductors and malleable, and ductile
- b. Metalloids - Are shiny or dull, somewhat malleable, and are semi-conductors.
- c. Nonmetals - Are dull, poor conductors and brittle.

Mixtures are a combination of two or more substances that are not chemically combined.

Mixtures can be physically separated physically by:

Distillation -boiling off the substance with the lower boiling temperature.

Magnets -separating material with magnetic properties.

Centrifuges -separate by densities (by spinning the mixture very fast) .

Solution

Solutions are homogeneous mixtures (the same throughout) where one substance is dissolved into another. Solutions may appear to be pure substances but are not.

A Solute is the substance that is dissolved. Such as salt in a salt water solution.

A Solvent is the substance that the solute is dissolved in. Such as the water in a salt water solution.

Concentration

is how much salt (or other solute) that is dissolved into the solvent. If there is a lot of solute dissolved into the solvent we call it concentrated. If there is little solute dissolved then we call it dilute.

Suspension

A mixture in which particles of a material eventually settle out.

Examples of suspensions include Italian salad dressing, & orange juice with pulp.

Colloid

A mixture in which the particles are not heavy enough to settle out.

Examples of colloids include milk, mayonnaise, gelatin, and whipped cream.

Elements, The Periodic Table, Compounds and Mixtures

Pure Substance: A substance in which there is _____.

There are two types of pure substances.

1. _____: A pure substance that cannot be separated into _____ substances by physical or chemical means. This is a _____ kind of atom.
2. Compounds: A pure substance composed of _____ chemically combined elements. These can be separated or broken down into elements by _____ -not physical- changes.

Elements are classified into categories according to groups of similar properties. The three major categories of elements are:

- a. _____ - Are shiny, good conductors and malleable, and ductile; found on the periodic table to the _____ of the zigzag line
- b. _____ - Are shiny or dull, somewhat malleable, and are semi-conductors; also called _____, are the elements that _____ the zigzag line.
- c. _____ - Are dull, poor conductors and brittle; found on the periodic table to the _____ of the zigzag line.

Arranging the Elements

Dmitri Mendeleev – 1860's; _____ Chemist; Known as the Father of the _____ of Elements; Put the known _____ on cards with their known physical and chemical properties and found out that there was a _____ pattern when the elements were arranged in order of _____ atomic _____

The properties of the elements are _____, which means to have a _____.

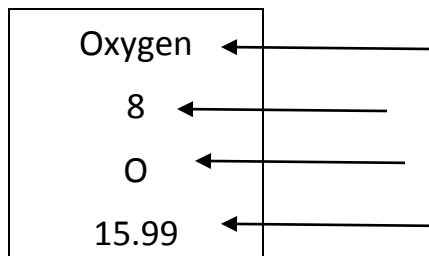
Henry Moseley – 1914; British Scientist -- He was able to determine the number of _____ in each element (the atomic _____). When he arranged the elements according to the atomic _____ everything was in its _____ place.

Periodic Law – the _____ and _____ properties of an _____ are _____ functions of their atomic _____

Grouping the Elements

Period – each _____ row of elements (from left to right). There are _____ periods.

Group – each _____ of elements from top to bottom; also called a _____.
There are _____ groups. Most groups have similar _____ and _____
properties.



Mixtures are a combination of two or more substances that are not _____ combined.

Mixtures can be physically separated _____ by:

_____ -boiling off the substance with the lower boiling temperature.

_____ -separating material with _____ properties.

_____ -separate by densities (by spinning the mixture very fast).

Solution

Solutions are homogeneous _____ (the same throughout) where one substance is _____
into another. Solutions may _____ to be pure substances but are not.

A _____ is the substance that is dissolved. Such as _____ in a salt water solution.

A _____ is the substance that the solute is dissolved in. Such as the _____ in a salt water
solution.

Concentration

is how much salt (_____) that is dissolved into the solvent. If there is a lot of
solute dissolved into the solvent we call it _____. If there is little solute dissolved then
we call it _____.

Suspension

A mixture in which particles of a material eventually _____.

Examples of suspensions include Italian salad dressing, & orange juice with pulp.

Colloid

A mixture in which the particles are _____ to settle out.

Examples of colloids include milk, mayonnaise, gelatin, and whipped cream.