Chemistry 112

An Introduction to Chemistry.pptx

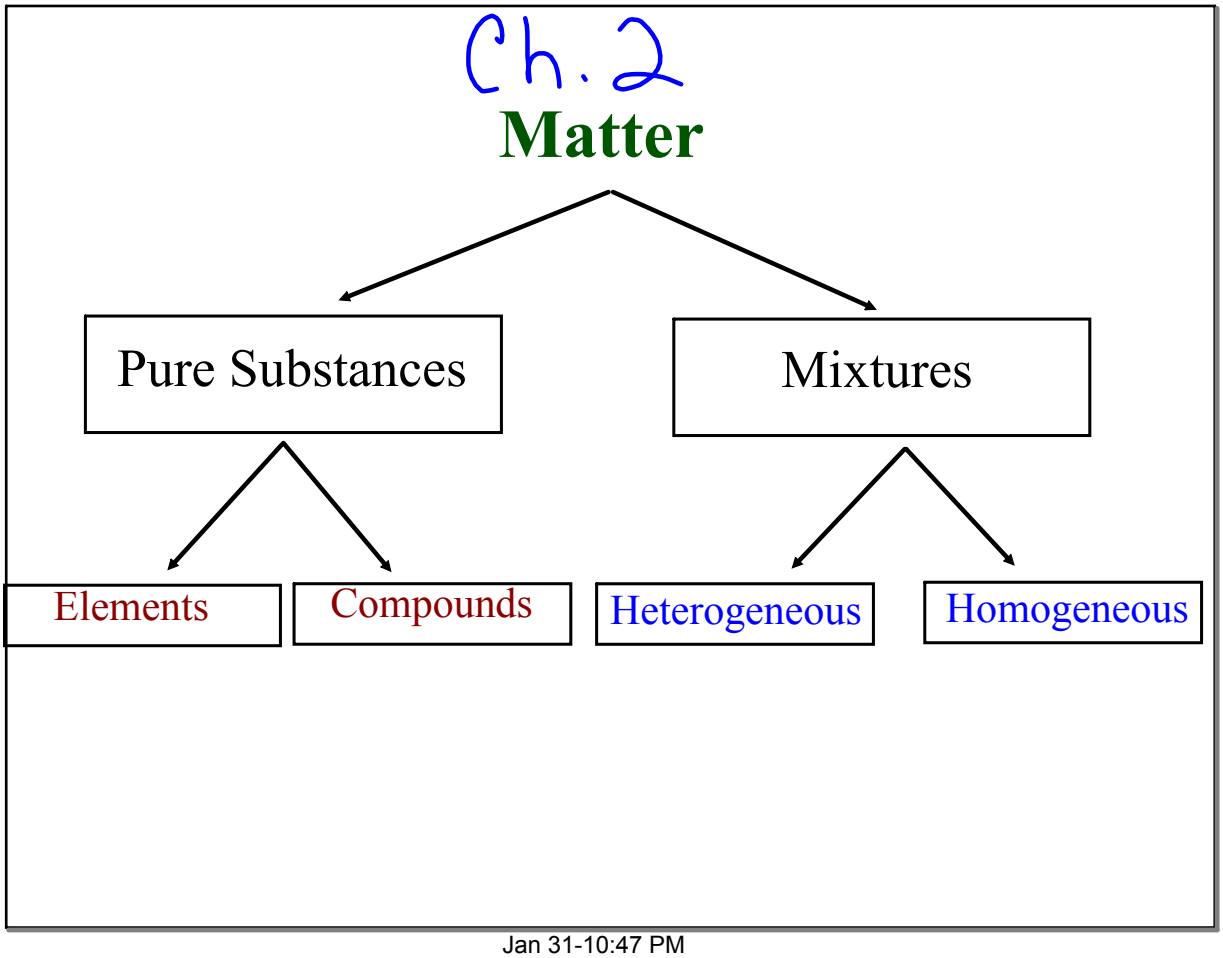
Chemistry 112 - Chapter One.pptx

Sep 8-10:09 AM

Introduction to Chemistry.doc

Scientific method

Sep 8-10:09 AM



Jan 31-10:47 PM

Types of Matter

Pure Substances - matter whose composition is constant and uniform
Ex. gold

Mixtures - impure substances
- matter whose composition varies.

Heterogeneous Mixtures - are non-uniform and may have **more than one phase.**
Ex. cornflakes and milk

Homogeneous Mixtures - are uniform and consist of **one phase**
Ex. salt water (solutions)

Atom - **the smallest particle** into which an element can be separated
- basic building blocks of matter

Elements - a substance made up of only **one type of atom**
- cannot be separated into simpler substances by chemical or physical means

Compounds - substances containing **atoms of more than one element** chemically combined in a definite fixed ratio
- can be separated into simpler substances by chemical means

Molecule - a distinct particle made up of **two or more atoms.**
Ex. H_2O (one molecule of water has two hydrogen atoms and one oxygen atom)
does not have to be two different elements
Ex. H_2, O_2, N_2

It may be easier to think of it this way...

A molecule is formed when two or more atoms join together chemically.

A compound is a molecule that contains at least two different elements.

All compounds are molecules but not all molecules are compounds.

Chemical Formula - a group of symbols representing the number and type of atoms and ions in a chemical substance.

Sep 4-6:35 PM

CHEMISTRY 112
Matter & Its Diversity

physical changes - are those in which no new substances are formed.
Ex. boiling - $H_2O_{(l)}$ --> $H_2O_{(g)}$

chemical changes - are those in which a new substance is formed.
Ex. C + O_2 --> CO_2
↓
chemical reaction

qualitative knowledge - describes changes in matter not involved with a measured quantity. Ex. color

quantitative knowledge - involves a measure of the **amount** of matter or the **amount** of change in a measurable property of matter.
- involves a number (usually)
Ex. mass of magnesium is 1.2 g

empirical knowledge - observable information that can be measured.
Ex. dinosaurs did exist

theoretical knowledge - explains observations in terms of ideas.
Ex. dinosaurs died 65 million years ago due to an asteroid strike.

COMPONENTS OF EXPERIMENTAL DESIGN
Manipulated Variable (independent variable)
- the property that is being changed

Responding Variable (dependent variable)
- the property that changes as a result of the change in the manipulated variable.

Controlled Variable
- a property that is kept constant.

Example: How does sleep affect performance in school?

↑sleep → better in school
indep dep
↓sleep → don't do as well in school

Sep 2-10:13 AM

- PROPERTIES USED TO DESCRIBE MATTER CAN BE CLASSIFIED AS EXTENSIVE OR INTENSIVE
- **Extensive** properties include:
  - The mass of the object
  - The volume of the object
  - Depends on the **amount** of matter in a sample

Intensive properties include:
- Hardness
- Smoothness
- Depends on the **type** of matter in a sample
- Ex. All samples of pure gold have identical intensive properties because their chemical composition is identical.

Assignment p. 52 #20-27

Sep 12-10:32 AM

https://quizlet.com/3970246/extensive-property-or-intensive-property-flash-cards/

extensive property (EP).

INTENSIVE PROPERTIES

Intensive properties are bulk properties, which means they do not depend on the amount of matter that is present.

Examples of intensive properties include:

Boiling point
Density
State of matter
Color
Melting point
Odor
Temperature
Refractive Index
Luster
Hardness
Ductility
Malleability

Intensive properties can be used to help identify a sample because these characteristics do not depend on the amount of sample, nor do they change according to conditions.

EXTENSIVE PROPERTIES

Extensive properties do depend on the amount of matter that is present. An extensive property is considered additive for subsystems. Examples of extensive properties include:

Volume
Mass
Size
Weight
Length

The ratio between two extensive properties is an intensive property. For example, mass and volume are extensive properties, but their ratio (density) is an intensive property of matter.

While extensive properties are great for describing a sample, they aren't very helpful identifying it because they can change according to sample size or conditions.

WAY TO TELL INTENSIVE AND EXTENSIVE PROPERTIES APART

One easy way to tell whether a physical property is intensive or extensive is to take two identical samples of a substance and put them together. If this doubles the property (e.g., twice the mass, twice as long), it's an extensive property. If the property is unchanged by altering the sample size, it's an intensive property.

Sep 8-10:25 AM

EXERCISE

p. 52 #20-27
P 55. # 28-34

Sep 4-6:49 PM

Tuesday, Sept 12/17

- notes on matter
- correct homework
- continue with notes
- Assignment
- Wednesday - come to class for attendance- Fred Fox presentation
- lunch help if required
- Thursday chapter 1 quiz

Sep 12-10:50 AM

Feb 12-10:30 AM

Attachments

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