

TEXTBOOK NOTES

great work!

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8/31/23

Properties of Matter

12/15

Physical Properties are broken down into two types.

Intensive Properties do not depend on the amount of substance present. Ex. Density (at constant temperature is the same no matter the substance's amount).

Extensive Properties depend on matter being measured. Ex. Mass depends on the amount of substance there is.

Chemical Properties are when a substance has the ability to change its identity or combine with other substances. Ex. iron forms rust when combined with air.

As well as the inability to change into another substance. Ex. iron doesn't change when in the presence of nitrogen.

STATES OF MATTER

Matter exists in 3 main states

SOLIDS are forms of matter that have their own shape and volume. Their particles are tightly packed together in a specific pattern and cannot move around freely.

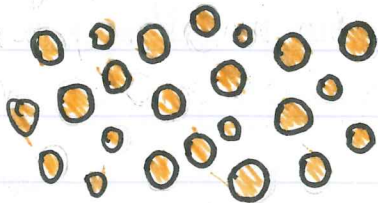


Examples: Iron, Wood, Metal, Ice.

Viscosity is the speed at which molecules move in a liquid. It is also referred to as the friction between the molecules of the liquid.

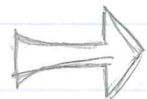
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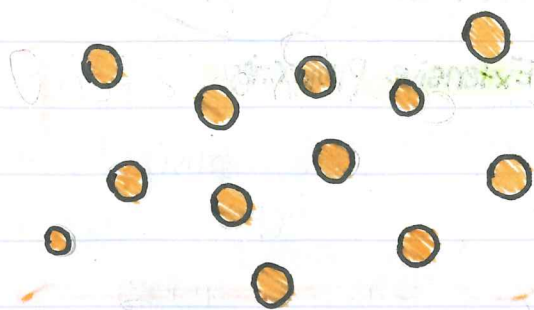
LIQUIDS are substances that flow freely and have a constant volume.



The particles are loosely packed which allows the liquid to form the shape of its container.

Examples: Water, blood





GASES do not have a fixed shape or volume and is dependent on its container. A gas will expand to fill the entirety of the container.

Its molecules move quickly and spread far apart, because of this, **gases can be compressed**.

Examples: Air, steam

Gas contains a thermodynamic state at room temperature

Gas and vapor **DONT** mean the same thing

A substance that is either a solid or a liquid at normal temperature can exist in a gaseous state as a **vapor**

Example: At room temperature, water exists as a liquid, making steam a vapor

Section 3.1 Assessment

Problem 1: Physical properties like color, odor, temperature which are intensive and size, volume, and mass which are extensive. Chemical properties like flammability and toxicity.

Problem 2:
a. Chemical b. Physical
c. Chemical d. Physical
e. Physical

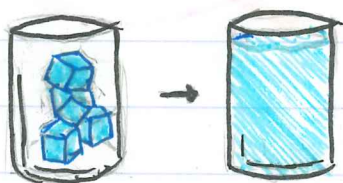
Changes in Matter

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PHYSICAL CHANGE

Any alteration that changes its appearance without adjusting the substance's molecular composition.

Example: When an ice cube melts, a shift from solid to liquid occurs. Water continues to be the same substance.

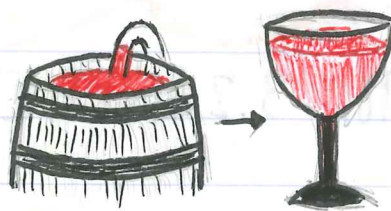


Verbs: cut, bend, crumple, crush, split, grind

CHEMICAL CHANGE

The process in which matter combines with or changes into a new substance, altering the substance's molecular composition.

Example: In the wine-making process, the fermentation of its ingredients produces wine which is a chemical change.

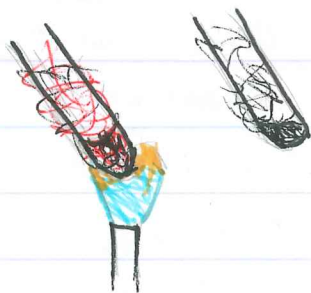


Verbs: burn, explode, rust, tarnish, ferment, rot

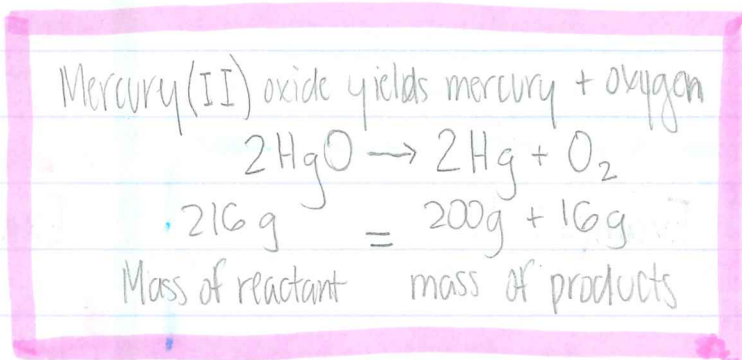
CONSERVATION OF A MASS

In the late 18th century, the analytical balance was invented where it was capable of measuring small changes in mass. After lots of observation, scientists made this into the **law of conservation of mass**. This law states that mass, during a chemical reaction, is neither created nor destroyed but is conserved.

Equation Form:
Mass reactants = Mass products



EXAMPLE: When Mercury oxide is heated, it forms to a silvery liquid and oxygen gas. The mass before and after the reaction will be the same.



SECTION 3.2 ASSESSMENT

Problem 11: A chemical change is when the substance's molecular composition changes by having a reaction or combining with other substances. 4 indicators are change in color, odor, energy, and formation of a gas

Problem 12a: 58.44 g of sodium chloride

b. 66.7 g

Problem 13: Incorrect because physical change is the change of appearance of a substance