

Chapter 2 Review for Test

1. States of matter:

- a. Solid – definite shape, definite volume, particles are packed together tightly, not easily compressed. Examples include: ice (water at 0°C),
- b. Liquid – has definite volume, not easily compressed, takes on the shape of container (indefinite shape), particles are close but are free to flow. Examples at room temperature: water, milk, grape juice
- c. Gas – takes the shape and volume of its container (indefinite shape or volume), expands to fill up a container, particles are spaced relatively far apart, easily compressed. Examples at room temperature: oxygen, hydrogen, helium, steam (water above 100°C)
- i. Vapor – a gaseous substance that is generally a liquid or solid at room temperature
- ii. Gas – a substance that exists in the gaseous state at room temperature

2. Physical changes – alters a substance without changing its composition.

a. Examples include:

cutting, grinding, bending

breaking, mixing, dissolving

and changes of state (freezing, melting, boiling, condensation, evaporation, vaporization, sublimation)

3. Physical properties – Can be observed or measured without changing the composition of the substance.

a. Examples include: color, odor, malleability, hardness, conductivity, melting/boiling/freezing points

4. Chemical properties – can only be observed when a substance undergoes a chemical change. Substance's ability to undergo changes that transform it into different substances5. Chemical change – no change in mass occurs. 2 or more elements combine to form new compound(s). Also referred to as chemical reactions. Can be shown in chemical equations ($\text{Na} + \text{Cl} \rightarrow \text{NaCl}$). Energy is transferred. Indicators include giving off heat or light, change in color,

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formation of a gas, formation of a precipitate (solid that forms and settles out of a liquid mixture).

Examples: rusting, cooking, digesting, burning

6. During physical or chemical changes, substances can absorb or give off energy
7. Intensive property – depends on the type of matter in a sample.
 a. Examples include: freezing/melting/boiling point, density, able to conduct heat/electricity
8. Extensive property – depends on the amount of matter in a sample
 a. Examples are mass and volume. Smaller volume will heat up or cool down quicker
9. Filtration and Distillation – ways to separate mixtures based on physical properties
 a. Distillation – a liquid is boiled to produce a vapor that is then condensed again to a liquid
 b. Filtration – used to separate a solid from a liquid in a heterogeneous mixture
10. First of thermodynamics (conservation) – mass of the reactants equals the mass of the products. Mass is neither created nor destroyed. Energy is neither created nor destroyed
11. Reactants → products. Reactants – starting substance in a chemical reaction.
Products – substances formed in a chemical reaction
12. Mass – measurement of the amount of matter that an object contains
13. Volume – amount of space something takes up
14. Mixtures – a blend (physical change) or two or more components
 a. Homogeneous mixtures – also known as solutions, have a uniform composition, consist of 2 things that are simply mixed together (physical change)
 Heterogeneous – different composition
15. Element – simplest form of matter with a unique set of properties.
 a. Chemical symbols are found on the Periodic Table and consist of 1 to 2 letters. First letter is always capitalized and if there is a second letter, it is always lower case.
 b. Examples: Carbon (C), Hydrogen (H), Oxygen (O), Iron (Fe), Sodium (Na)
16. Compound – 2 or more elements chemically combined in a fixed proportion, properties can be very different from those of its elements. Can only be broken down into simpler substances by chemical means. Water is one example as its chemical formula is H₂O
17. Periodic Table:
 a. Group – vertical column ↓ labeled 1-18
 b. Period – horizontal row ↔ labeled 1-7

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