**Physical Science NCFE Guided Review: 2.1**

**(Classification of Matter, Phases, Bohr Models)**

**PSc.2.1.1 Classify matter as homogeneous or heterogeneous; pure substance or mixture; element or compound; metals, nonmetals, or metalloids; solution, colloid, or suspension.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Classification** | **Category** | **Sub-Category** | **Definition** | **Examples** |
| **Pure Substance** | **Element** | **Metal** |  |  |
| **Nonmetal** |  |  |
| **Metalloid** |  |  |
| **Compound** | **Ionic** |  |  |
| **Covalent** |  |  |
| **Metallic** |  |  |
| **Mixture** | **Heterogeneous** | **Suspension** |  |  |
| **Colloid** |  |  |
| **Homogeneous** | **Solution** |  |  |

**PSc.2.1.2 Explain the phases of matter and the physical changes that matter undergoes.**

Phases

Solid: Liquid: Gas:

**Melting**: from \_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_, energy is \_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

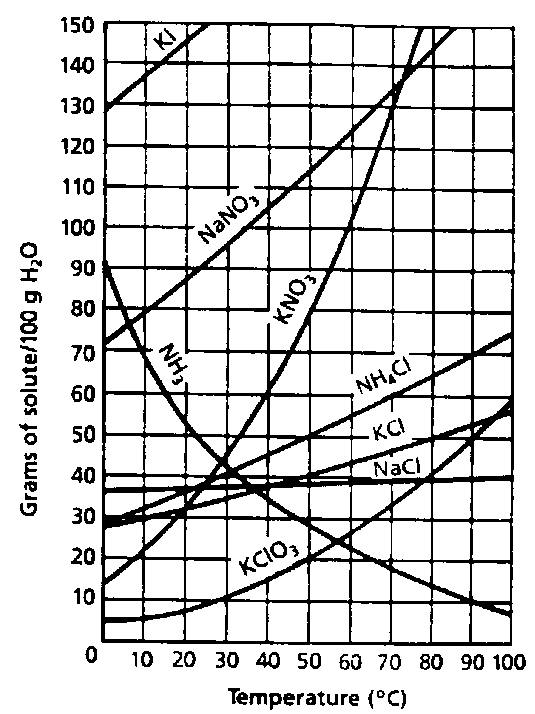
**Freezing**: from \_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_, energy is \_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

**Vaporization**: from \_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_, energy is \_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

**Condensation**: from \_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_, energy is \_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

|  |  |  |
| --- | --- | --- |
|  | **Boiling** | **Evaporation** |
| Particles Involved |  |  |
| Energy Requirement |  |  |

Solubility



1. How many grams of potassium nitrate can dissolve in 200 grams of water at 40 degrees Celsius?

2. If 100 grams of sodium nitrate are dissolved in 100 grams of water at 50 degrees Celsius, what type of solution will result?

**Saturated:**

**Unsaturated:**

**Supersaturated:**

Parts of Solution

**Solute**:

**Solvent**:

“Like dissolves like” 🡪

**PSc.2.1.3 Compare physical and chemical properties of various types of matter.**

|  |  |
| --- | --- |
| **Physical Property** | **Chemical Property** |
| **Physical Change** | **Chemical Change** |

Density

Equation:

Concept:

Chemical and Physical Properties of Various Substances

|  |  |  |
| --- | --- | --- |
| **Substance** | **Physical Properties** | **Chemical Properties** |
| Metals |  |  |
| Nonmetals |  |  |
| Metalloids |  |  |
| Sugar |  |  |
| Baking Soda |  |  |
| Salt |  |  |
| Cornstarch |  |  |
| Rubbing Alcohol |  |  |
| Water |  |  |

**PSc.2.1.4 Interpret the data presented in the Bohr model diagrams and dot diagrams for atoms and ions of elements 1 through 18.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Subatomic Particles** | | | | |
|  | **Location** | **Charge** | **Mass** | **Determined By:** |
| **Protons** |  |  |  |  |
| **Neutrons** |  |  |  |  |
| **Electrons** |  |  |  |  |

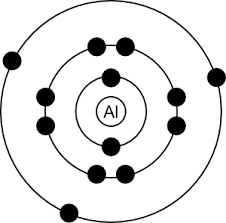
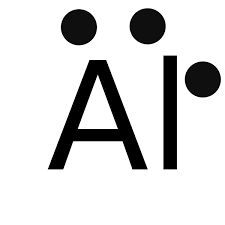
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Element** | **Mass Number** | **Atomic Number** | **Protons** | **Neutrons** | **Electrons** |
| 18C |  |  |  |  |  |
| Lithium—20 |  |  |  |  |  |
| U—238 |  |  |  |  |  |
| Chlorine |  |  |  |  |  |

Isotopes

Definition =

Symbols: -or-

Bohr Model Lewis Dot Diagram

Sample Questions

1. Which material would be classified as homogeneous?

1. stainless steel bolt
2. granite rock
3. soda pop
4. apple

2. Which of the elements listed is a metalloid?

1. carbon
2. antimony
3. sulfur
4. helium

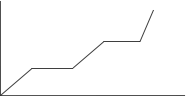
3. What classification would best describe a material with the following characteristics?

-white liquid

-not separated by filtration -scatters light

1. element
2. solution
3. colloid
4. suspension

5. The graph below shows a heating curve for a pure substance at normal atmospheric pressure. Use the graph to answer the questions that follow.



What happens to the molecules during segment II?

* 1. Energy of the molecules forms chemical bonds.
  2. Energy of the molecules breaks chemical bonds.
  3. Energy of the molecules overcomes intermolecular attractions.
  4. Energy of the molecules strengthens intermolecular attractions.

6. What phase change occurs during segment IV of the graph?

* 1. solid to liquid
  2. solid to gas
  3. liquid to gas
  4. liquid to solid

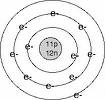
7. What process occurs during segment III?

* 1. increase in temperature of the solid
  2. increase in temperature of the liquid
  3. melting of the solid
  4. boiling of the liquid

8. Which is a characteristic property of aluminum?

* 1. reacts with oxygen to form rust
  2. reacts with water
  3. dissolves in alcohol
  4. forms into a wire

9. Which element is represented by the diagram below?



* 1. magnesium
  2. sodium
  3. titanium
  4. vanadium

10. Which element could have the dot diagram shown below?

:X

* 1. Carbon
  2. Magnesium
  3. Helium
  4. Potassium