

**19.1: Most Materials are Mixtures**

What is a **Mixture**?

→ Is the formation of a mixture a physical or chemical change? \_\_\_\_\_ Why?

**Examples of Mixtures:**

1)

2)

**How can mixtures be separated by physical means?**

**Ways to separate a mixture:**

1.)

**Ex:**

2.)

**Ex:**

**19.2: The Chemist's Classification of Matter**

Matter can be \_\_\_\_\_ or \_\_\_\_\_.

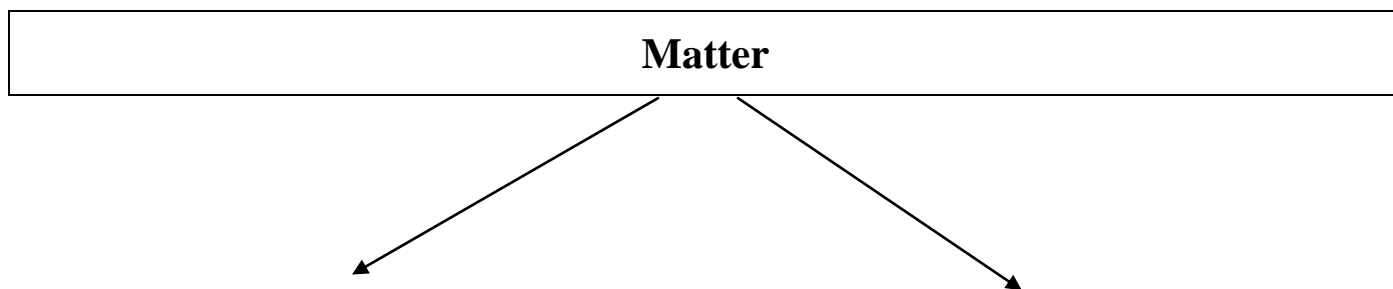
What does it mean for a material to be **Pure**?

Ex:

What does it mean for a material to be **Impure**?

Ex:

Many kinds of matter exist and can be classified using the following system:



*Let's define some of the above terms:*

I. **Homogeneous Mixture:**

a.) **Solution:**

Ex of solutions:

b.) **Suspension:**

Ex of suspensions:

II. **Heterogeneous Mixture:**

Ex:

### 19.3: A Solution is a Single-Phase Homogeneous Mixture

List and define the 2 parts to any solution:

- 1.
- 2.

What does the term “**dissolving**” mean?

For the following examples, list the 2 parts that make up the solution:

- |                     |                        |
|---------------------|------------------------|
| a.) Salt water:     | b.) Carbonated drinks: |
| c.) Dental amalgam: | d.) Humid Air:         |

*There is a limit to how much of a given solute can be dissolved in a given solvent.*

**2 different types of solutions:**

1. **Unsaturated:**
2. **Saturated:**

### 19.4: Concentration is Given as Moles per Liter

Define **Concentration:**

When we say that a solution is dilute or concentrated, we are expressing *the amount of solute present*:

- Define **Dilute:**
- Define **Concentrated:**

What is the overall *equation* for **the concentration of a solution**?

Chemists are often more interested in the number of solute particles in a solution than in the number of grams.

What is a **Mole**?

1 dozen = \_\_\_\_\_ objects

ex: 1 dozen eggs is \_\_\_\_\_ eggs

1 ream = \_\_\_\_\_ objects

ex: 1 ream of paper is \_\_\_\_\_ sheets of paper

1 mole = \_\_\_\_\_ objects

ex: 1 mole of iron atoms is \_\_\_\_\_ atoms of iron

What is the *equation* for the **Molarity** of a solution?

### **Molarity Examples:**

**Ex 1:** Intravenous (IV) solutions are often administered to patients in the hospital. One saline solution contains 0.15 moles of sodium chloride dissolved in 2 L of solution. What is the molarity of the IV solution?

**Ex 2:** What is the molarity of a solution containing 1.4 moles of acetic acid ( $\text{HC}_2\text{H}_3\text{O}_2$ ) in 2.5 L of solution?

**Ex 3:** Household laundry bleach is a dilute aqueous solution of sodium hypochlorite ( $\text{NaClO}$ ). How many moles of solute are present in 1.5 L of 0.70 M bleach?

**Ex 4:** I need to make a 1.2 M sucrose (sugar) solution. To do this, I have 4.3 moles of sucrose. How many liters of solution can I make?

**Ex 5:** A.) How many moles of sucrose are there in 0.5 L of a 2 molar (M) solution?

B.) How many molecules of sucrose is this?

## 19.5: Solubility Measures How Well a Solute Dissolves

Define **Solubility:**

Terms to describe the solubility of a solute in a solvent:

**Soluble:**

Ex:

**Insoluble:**

Ex:

Fill in the following table describing the factors that affect how slow or quickly a solid will dissolve:

<b>Factor</b>	<b>Effect on Rate of Dissolving</b>	<b>Reason Why</b>
1.		
2.		
3.		

*Sketch a graph of solubility vs. temperature for a solid:*

### **\* Solubility of Gases:**

#### **❖ In terms of Temperature:**

Why does this happen?

*Sketch a graph of solubility vs. temperature for a gas:*

#### **❖ In terms of Pressure:**

Why does this happen?