Metrics & Density

Gather the following items:

Paper/Pencil

Calculator

Periodic Table

Salt and Sand Write-Ups

IV. Data

1. mass of beaker= **24.13 g**
2. mass of beaker + salt= **25.15 g**
3. volume of water = **20.1 mL**
4. mass of evap. dish and watch glass = **44.07 g**
5. mass of evap. dish / watch glass + salt = **44.88 g**

V. Calculations

1. Initial mass of salt

Mass of Beaker & Salt	**25.15g**
-Mass of Beaker	**-24.13g**
Mass of Salt	**1.02g**

2. Mass of salt recovered

Mass of evap dish / WG & Salt	**44.88g**
-Mass of evap dish/ WG	**-44.07g**
Mass of Salt	**0.81g**

3. Percent Error

$$\text{\% error} = \frac{|\text{measured} - \text{accepted}|}{\text{accepted}} \times 100\%$$

$$\text{\% error} = \frac{|0.81\text{ g} - 1.02\text{ g}|}{1.02\text{g}} \times 100\%$$

% error = 21%

Important Metric Measurement Units

Unit	Definition	English Units	Metric Units	Measurement Device
Volume	amount of space	cup, quart, gallon, etc...	milliliter (cm^3) liter (dm^3)	graduated cylinder
Mass / Weight	amount of matter	ounces pounds	gram 1 mL water kilogram	balance

Density

Fundamentals

A measure of the compactness of matter

Mathematically, it is the ratio of mass and volume

$$D = \frac{\text{Mass}}{\text{Volume}}$$

$$\frac{\text{gram}}{\text{ml}} \qquad \frac{\text{gram}}{\text{cm}^3}$$

Density

Sample Problem #1

- A metal block weighing 100.0g has a volume of 8.81 cm^3. If the block is an elemental metal, what type of metal is it?

$$D = \frac{\text{Mass}}{\text{Volume}} = \frac{100.0\text{g}}{8.81\text{cm}^3} = 11.4\text{g/cm}^3$$

Lead

(Density = 11.34g/cm^3)

Density

Sample Problem #2

- What is the mass of 1250mL of aluminum?

$$D = \frac{\text{Mass}}{\text{Volume}}$$

$$2.7\text{g/mL} = \frac{X}{1250\text{mL}}$$

$$X = 3400\text{g}$$