Percentage, Ratio Strength, Specific Gravity
Chapter 6

Objectives

Objectives:

- Apply **ratios and percentages** in pharmaceutical calculation
- Convert **percentage** w/w to w/v and vice versa
- Perform prescription calculations based on **ratio strength and percentage strength**

Density/ Specific Gravity

- **Density** is a measure of mass per unit volume.
- In the metric system it is the weight in grams/ 1 mL.
- What is the importance of density?

Density/ Specific Gravity

Rx

Miconazole 2% w/w

Boric acid powder qs 50 **g**

Dispense powder, DTD 50 **g**

Calculate the volume occupied by the final preparation. (The density of the powder is 1.2 g/mL)

Density/ Specific Gravity

- Specific Gravity: is the ratio of the density of a substance compared to the density of a reference material, usually water , at the same temperature.
- What is the unit of specific gravity?

Percentages

- The number of parts of the **solute** in 100 units of the **solution**

  Rx

Camphor	20 g
Anise oil	5 mL
Alcohol qs ad	125 mL

- What is the percentage of camphor in the final solution? (x g/100 mL), remember 100 ml is also called 1 dL
- What is the ratio strength of the solution?(1 g/Z mL)

Default rules

- W/W (solids in solid)
- W/V (solid in liquid)
- V/V (liquid in liquid)
- Examples:
  - Iodine solution 0.1%
  - Sulfur cream 10%
  - ZnO suspension 5%
  - Alcohol 70%

Default rules

- Indicate the percentage concentration of the following solution:
- Mineral oil 5 mL in 100 mL lotion.
- Mineral oil 5 grams in 100 mL lotion

Default rules

- % w/**v** ⟶ gram/ 100 mL
- mg% ⟶ mg/100mL or mg/dL
- The glucose level of a diabetic patient is 220 mg%. Express this value in mg/ dL, and as a gram percent.

  220 mg% = 220 mg/ 100 mL,

  220 mg%= 0.22 g% = 0.22 %

Example 1

A 5% w/w cream with a specific gravity of 1.1, will have a concentration of …….w/v.

Example 2

- The concentration of non-protein nitrogen in the blood of a patient is 30 mg%. Express this concentration in
- mg/mL,
- mg/dL
- % w/v.

Example 3

- If a patient has serum cholesterol level of 180 mg%
- Express the concentration in mg/dL

- How many milligrams of cholesterol would be present in a 10mL sample of the patient's serum?

Example 4

- A solution has a concentration of 1: 400 w/v
- Express the concentration in mg%
- How many μg would be in 40 μL of this solution?.