

## Solution concentration

%mass/volume: used for solutions used in intravenous (IV) therapy.

%mass/volume = g of solute/mL of solution x 100 (the units must be in g/mL)  
EG saline IV solution: 0.9% NaCl. That is 0.9g NaCl in 100mL water

### EXERCISE:

1. Calculate the % m/v of NaCl solution: 0.15g NaCl in 275mL water.

2. How would you prepare 2L of a 5% dextrose solution?

Mole, Molarity and Avogadro's number ( $6 \times 10^{23}$ )

1mol of atoms =  $6 \times 10^{23}$  atoms

1mol of molecules =  $6 \times 10^{23}$  molecules

1 single carbon atom: 12.01amu/mol

1 mole of carbon atoms: 12.01 g/mol

The mass of 1 mol of compound is called the molar mass (is the bottom number in the box for each element)

### EXERCISE:

1. Calculate the molar mass of sucrose  $C_{12}H_{22}O_{11}$

2. How many molecules of sucrose are found in the molar mass of sucrose?

Molarity (M) is the number of moles of solute in one liter of solvent (moles/liter)

$M = \text{moles of solute/L of solution}$

### EXERCISE:

1. A 1.5L solution contains 0.018 mol  $CO_2$ . What is the concentration of  $CO_2$  in moles/L (molarity)

2. How would you prepare the following solutions:
  - a. 1L 1M solution of sucrose
  - b. 1L 2M solution of sucrose
  - c. 500mL 1M sucrose
  
3. The molar mass of NaCl is 58g/mol. How many grams of NaCl are in 2L of 0.3M solution of NaCl?

**pH =  $-\log [H^+]$  The measure of acidity/alkalinity**

Concentration in molarity

EXERCISE:

Calculate the pH for the following solutions:

1.  $[H^+] = 1 \times 10^{-7}$ , pH =
2.  $[H^+] = 1 \times 10^{-4}$ , pH =
3.  $[H^+] = 1 \times 10^{-9}$ , pH =