CONCEPT OF MIXING

MISSION MBBS | NEET 2024

MOLE CONCEPT – L9

CLASS 11 | CHEMISTRY

FREE FOR 14 DAYS!

Aakash + BYJU'S

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Applications of Concentration terms

Concept of Mixing

- Dilution

$$N_1 V_1 = N_2 V_2$$

Or

$$M_1 V_1 = M_2 V_2$$

- Addition

$$N_1 V_1 + N_2 V_2 = N_3 V_3$$

- Neutralization

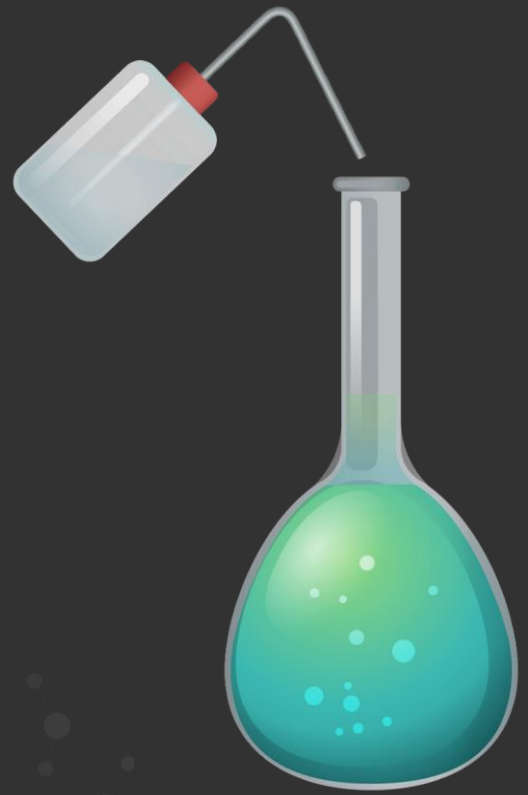
$$N_1 V_1 - N_2 V_2 = N_3 V_3$$

Dilution

Chemistry is **colorful** !!!

But why does the colour of the solution become faint when the volume is increased ???

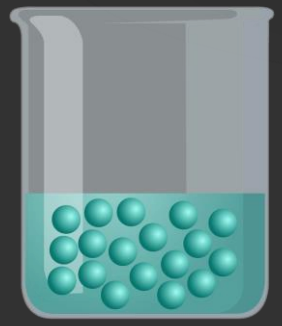
Is there any change in no. of moles of the solute particles ???



Dilution

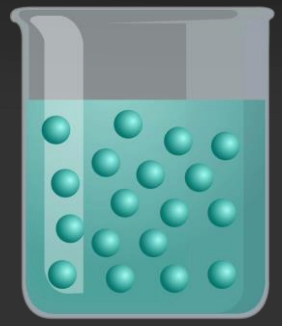
- What do you do if the tangy beverage you made is too sweet?

Dilution



Dilution

Add Solvent



Moles of solute before dilution (i) = **Moles of solute after dilution (f)**

$$C_iV_i = C_fV_f$$

Initial

diluted

For Molarity	For Normality
$M_iV_i = M_fV_f$	$N_iV_i = N_fV_f$

Concentrated sulphuric acid is 98% H_2SO_4 by mass and has a density of 1.80 gL^{-1}. Volume of acid required to make one litre of 0.1 M H_2SO_4 solution is:

A. 16.65 ml

B. 22.20 ml

C. 5.55 ml

D. 11.10 ml

0.5 M H_2SO_4 is diluted from 1 L to 10 L, normality of the resulting solution will be:

A. 1 N

B. 0.1 N

C. 10 N

D. 11 N

Mixing

- Dilution
- Addition
- Neutralisation

Mixing

Dilution

$C_1V_1 = C_2V_2$

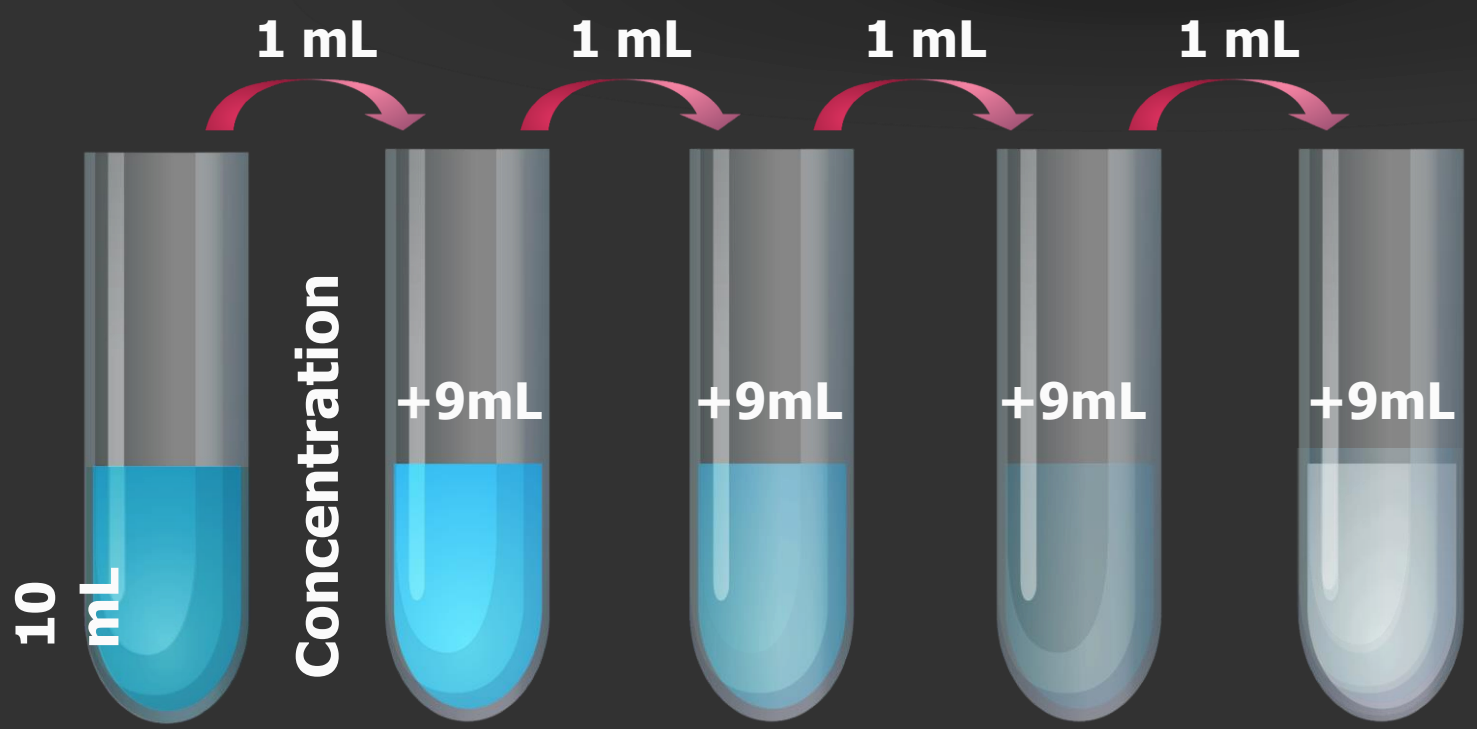
Addition

$C_1V_1 + C_2V_2 = C_3V_3$

Neutralisation

$C_1V_1 - C_2V_2 = C_3V_3$

Serial Dilution



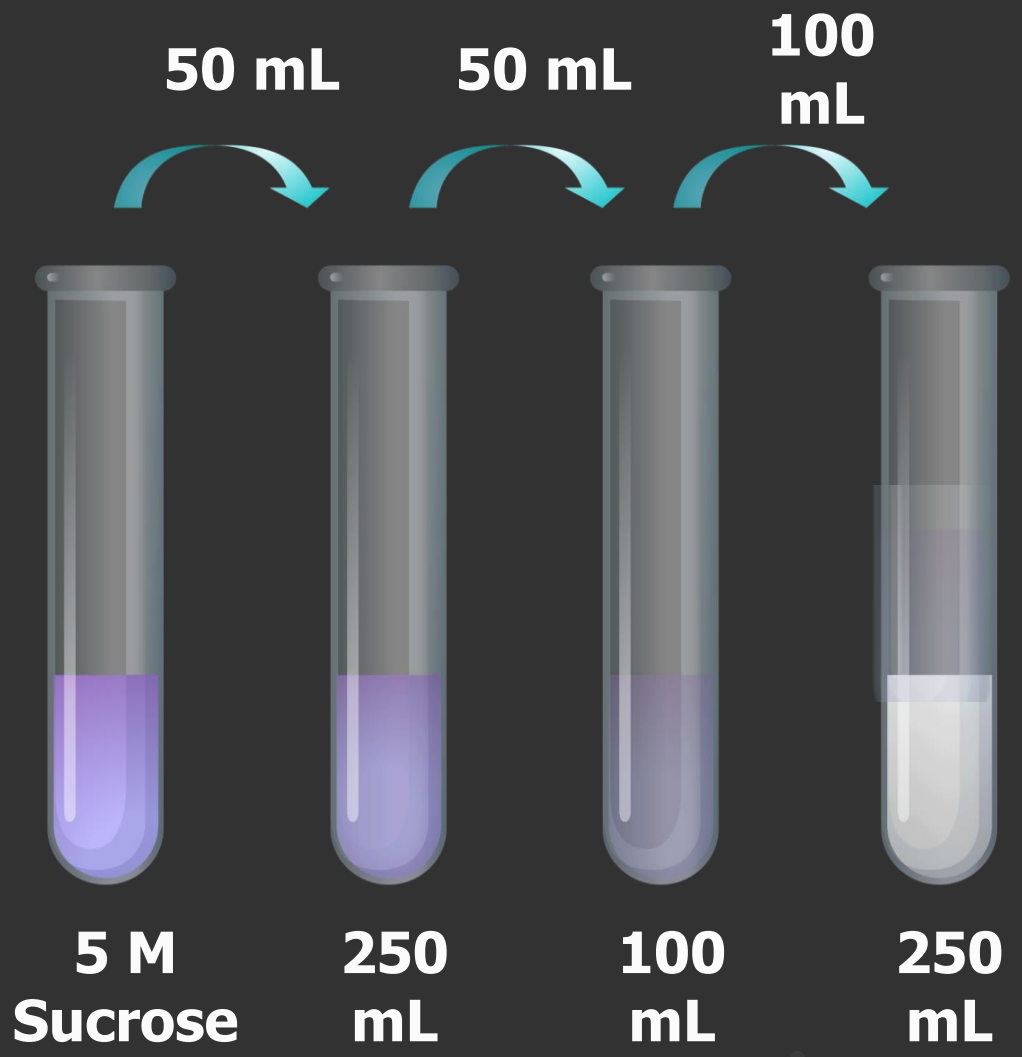
The following successive dilutions are applied to a stock solution that is 5 M sucrose:

Solution A = 50.0 mL of the stock solution is diluted to 250 mL

Solution B = 50.0 mL of Solution A is diluted to 100 mL

Solution C = 100.0 mL of Solution B is diluted to 250 mL

What is the concentration of sucrose in solution C?


50 mL
50 mL
100 mL
5 M Sucrose
250 mL
100 mL
250 mL

Addition

- What happens when HCl is added to HNO_3???

- What will happen to the $[H^+]$ concentration in the final solution?

$$C_1V_1 + C_2V_2 = C_3V_3$$

$$C_1V_1 + C_2V_2 = C_3(V_1+V_2)$$

100 mL decinormal HCl is mixed to 100 mL semi normal H_2SO_4 solution. Calculate normality of the resulting solution.

A. 0.3 N

B. 0.9 N

C. 1.5 N

D. 0.01 N

What will be the concentration of H_3O^+ in a solution which is made by mixing 25 mL of 0.2 M H_2SO_4, 35 mL of 0.25 M H_2SO_4 and 45 mL of 0.35 M H_2SO_4?

A. 0.3 N

B. 1.7 N

C. 0.57 N

D. 0.05 N

2.5 litre of 1 M NaOH solution is mixed with 3 litre of 0.5 M NaOH solution. Find molarity of OH^- resultant solution.

A. 0.80 M

B. 1 M

C. 0.73 M

D. 0.50 M

5 litre of 2 M NaOH is mixed with 2 litre of 2 N $Ca(OH)_2$. What will be the normality of OH^- in the resultant solution?

A. 1 N

B. 2 N

C. 2.57 N

D. 1.7 N

3 litre of 1 N H_3PO_4 solution is mixed with 2 litre of 1 N H_2SO_4 solution. What will be the molarity of the resultant solution?

A. 1 M

B. 2 M

C. 0.5 M

D. 0.4 M

1 L of 5 M H_2SO_4 is diluted to 5 L by adding water to it and the resultant solution is mixed with 3 L of 2 N HCl. The normality of H_3O^+ in the resulting solution will be:

A. 1 N

B. 2 N

C. 1.37 N

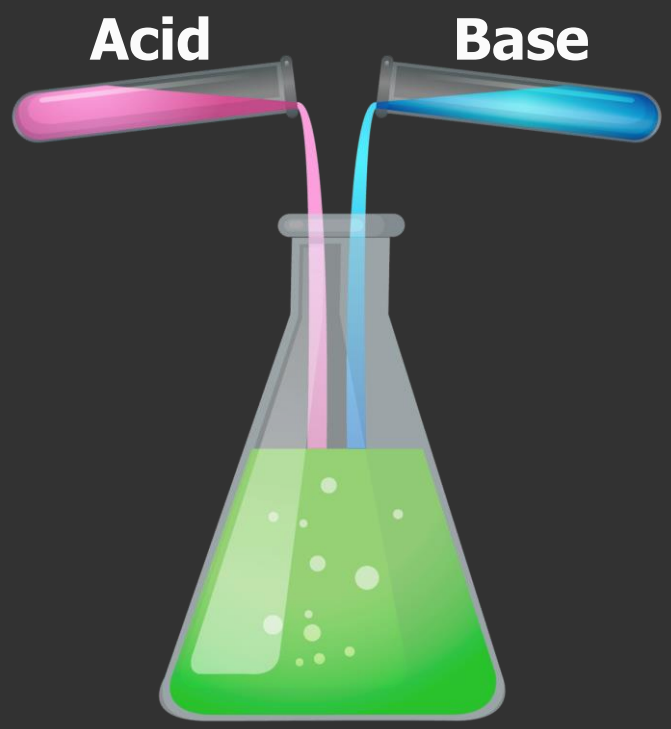
D. 4 N

Neutralisation

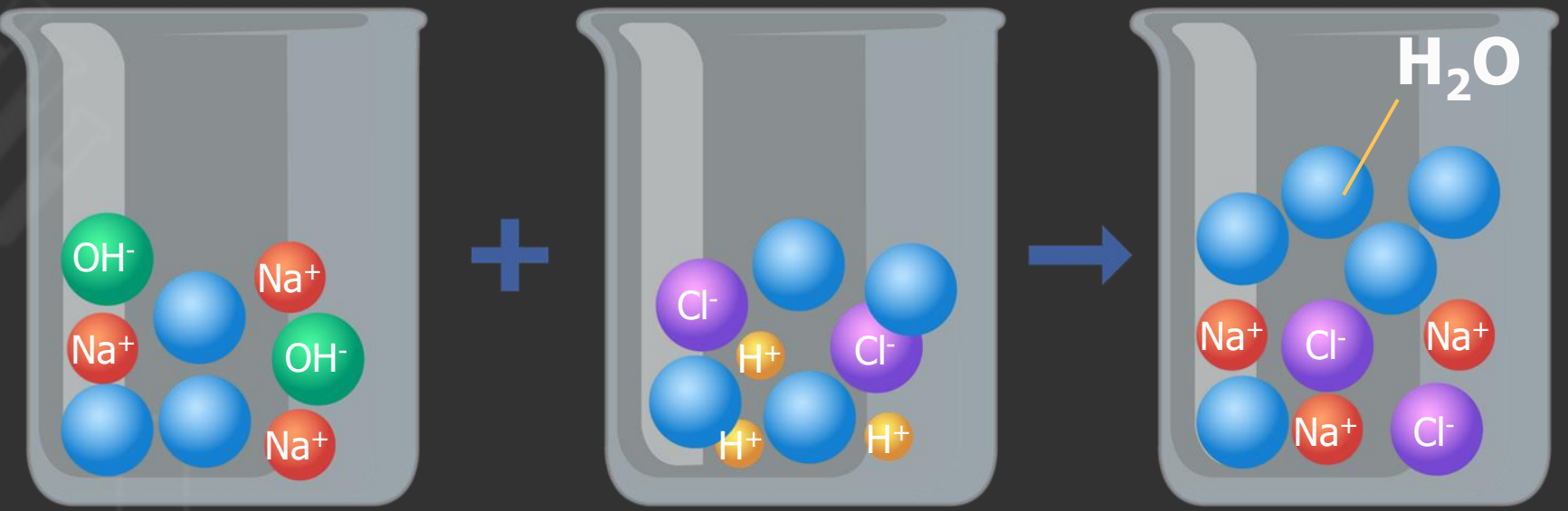
What happens in the stomach when we consume antacids?

Acid + Base → Salt + Water

$$| N_1 V_1 - N_2 V_2 | = N_3 V_3$$



N_1V_1 | N_2V_2 | $|N_1V_1 - N_2V_2|$



$NaOH_{(aq)}$ $HCl_{(aq)}$ $NaCl_{(aq)}$

1 L of 5 M H_2SO_4 is diluted to 5 L by adding water to it and the resultant solution is mixed with 3 L of 2 N HCl. The normality of H_3O^+ in the resulting solution will be:

A. Acidic, N/5

B. Basic, N/5

C. Basic, N/20

D. Acidic, N/10

100 mL each of 0.5 N NaOH, N/5 HCl and N/10 H_2SO_4 are mixed together. The resulting solution will be:

A. Acidic

B. Alkaline

C. Neutral

D. Strongly acidic

“Stay Positive, Work Hard, Make It Happen”

THANK YOU