Check Homework - Worksheet

Mg^{2+} SO_4^{2-} K^+ PO_4^{3-}

③ magnesium sulfate and potassium phosphate

$$MgSO_{4(aq)} + K_3PO_{4(aq)} \rightarrow Mg_3(PO_4)_{2(s)} + K_2SO_{4(aq)}$$

Complete Ionic:

$$Mg^{2+}_{(aq)} + SO_4^{2-}{}_{(aq)} + K^+_{(aq)} + PO_4^{3-}{}_{(aq)} \rightarrow Mg_3(PO_4)_{2(s)} + K^+_{(aq)} + SO_4^{2-}{}_{(aq)}$$

Spectator Ion(s):

$K^+_{(aq)}$, $SO_4^{2-}{}_{(aq)}$

Net Ionic:

$$3Mg^{2+}_{(aq)} + 2PO_4^{3-}{}_{(aq)} \rightarrow Mg_3(PO_4)_{2(s)}$$

K^+ NO_3^-

$$K_{(s)} + Pb(NO_3)_{2(aq)} \longrightarrow Pb_{(s)} + KNO_{3(aq)}$$

$$K_{(s)} + Pb^{2+}_{(aq)} + NO^-_{3(aq)} \longrightarrow Pb_{(s)} + K^+_{(aq)} + NO^-_{3(aq)}$$

Spectator Ion: $NO^-_{3(aq)}$

$$2K_{(s)} + Pb^{2+}_{(aq)} \longrightarrow Pb_{(s)} + 2K^+_{(aq)}$$

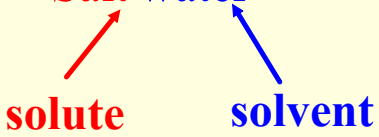
Solutions

Solution - homogeneous (uniform) mixture of a solute and a solvent.

⇒solute - substance dissolved

⇒solvent - substance doing dissolving (liquid)

Ex. Salt water

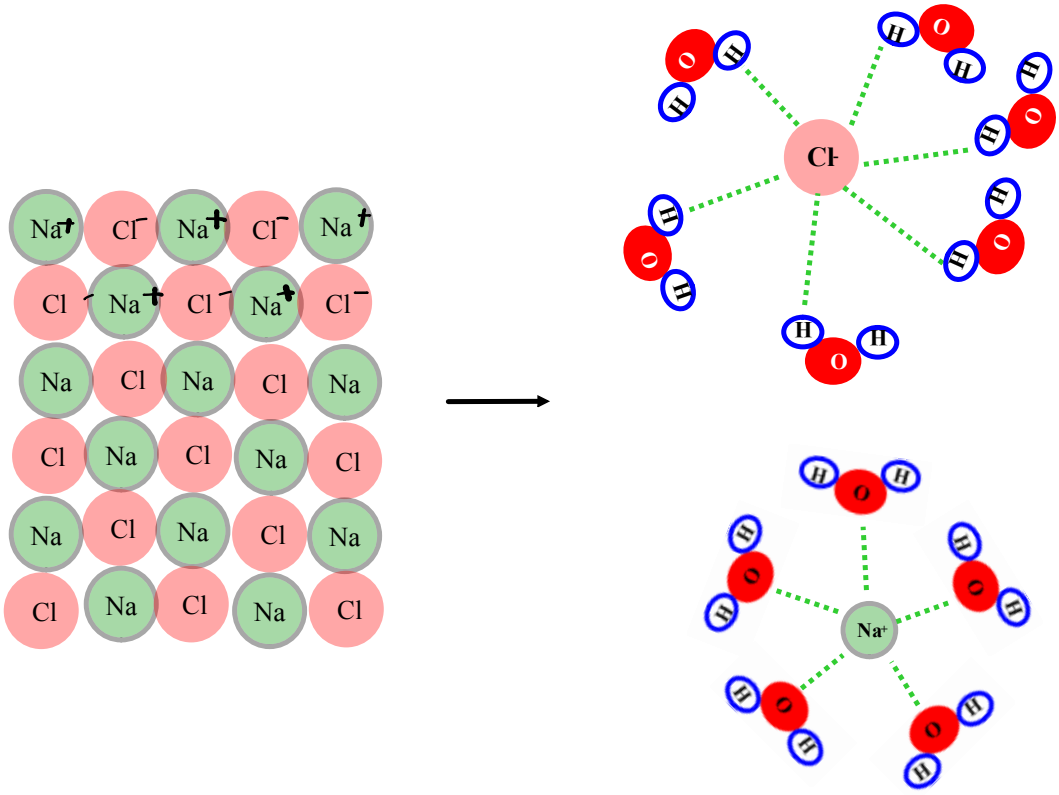


If the amount of solute that can dissolve in a solvent is large, then the solute is said to have a *high solubility.* (aq)

If the amount of solute that can dissolve in a solvent is small, then the solute is said to have a *low solubility.* → (s)

Solid substances formed from reactions in solutions are known as **precipitates**.

What happens when an ionic compound dissolves??



This process is called solvation.

Solution Formation

There are three factors that affect how fast a substance will dissolve:
1) temperature
2) agitation (stirring)
3) surface area of dissolving particles

Concentration of a Solution

concentration - a numerical ratio comparing the quantity of solute to the quantity of solution.

⇒units: **g/L or g/mL** (solutes that are solids in pure form)

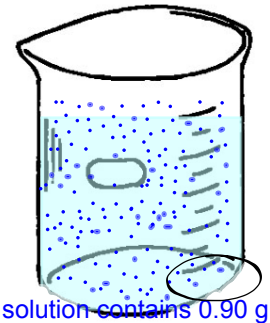
molar concentration (molarity) - the amount of moles of solute dissolved in one litre of solvent

⇒units: mol/L

dilute - a solution that has a small amount of solute as compared to the amount of solvent

dilution - process of adding more solvent to cause a solution to become more dilute

concentrated - a solution that has a large amount of solute as compared to the amount of solvent



Ex. An intravenous solution contains 0.90 g NaCl in 100.mL of solution. What is the molarity of this solution?

$m = 0.90g$

$V = 100.mL$

NaCl

$0.90g\ NaCl \times \frac{1\ mol\ NaCl}{58.44\ g\ NaCl} = 0.0154mol$

$NaCl \rightarrow (1 \times 22.99) + (1 \times 35.45) = 58.44g/mol$

$C = \frac{n}{V}$

$C = \frac{0.0154mol}{0.100L}$

$C = 0.15mol/L$

$M = \frac{n}{V}$

$C = \frac{n}{V}$

n ← # of moles (mol)

V ← volume (L)

C ← Concentration (molarity)

Ex. What volume of solution is required to dissolve 1.75 mol to make a 0.95 mol/L solution of $CaCO_3$?

Ex. A sample of laboratory ammonia solution has a concentration of 14.8 mol/L. What mass of ammonia is present in a 25.0 mL sample of this solution?