Check Homework - Worksheet

Pb^{2+} NO_3^- $K^+ \ NO_3^-$

④ potassium and lead (II) nitrate

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

$$K_{(s)} + Pb^{2+}_{(aq)} + \cancel{NO_{3(aq)}^-} \longrightarrow Pb_{(s)} + K^+_{(aq)} + \cancel{NO_{3(aq)}^-} \ |$$

$NO_{3(aq)}^-$

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

$Ca^{2+} OH^-$ $H^+ \ PO_4^{3-}$

㉙ $Ca(OH)_{2(aq)} + H_3PO_{4(aq)} \longrightarrow Ca_3(PO_4)_{2(s)} + HOH_{(\ell)}$

$$3Ca^{2+}_{(aq)} + OH^-_{(aq)} + H^+_{(aq)} + 2PO_4^{3-}{}_{(aq)} \longrightarrow Ca_3(PO_4)_{2(s)}^+$$

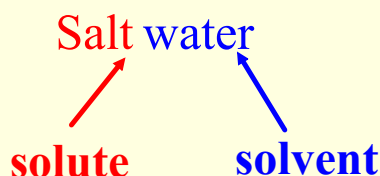$$HOH_{(\ell)}$$

|
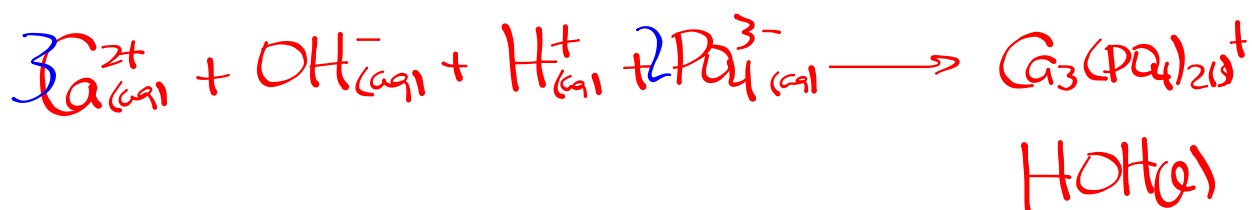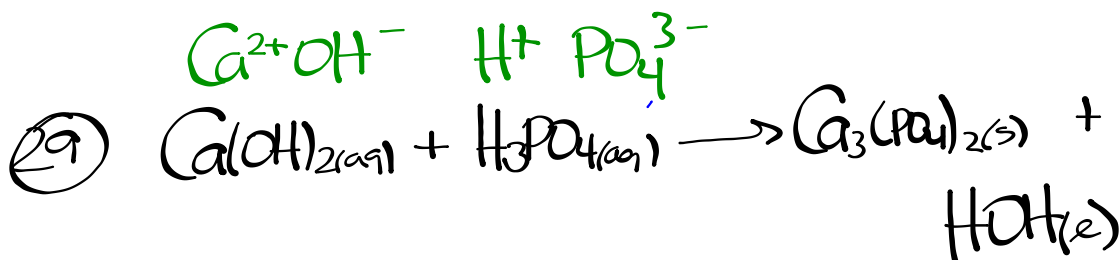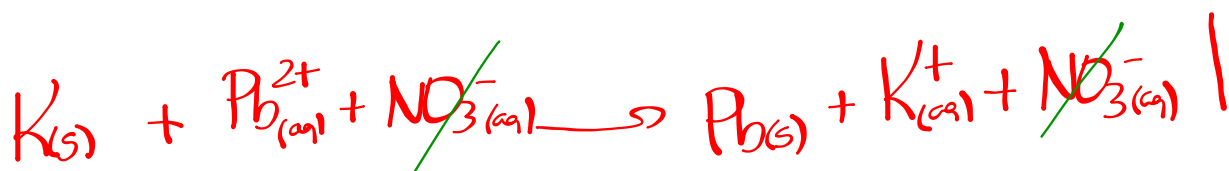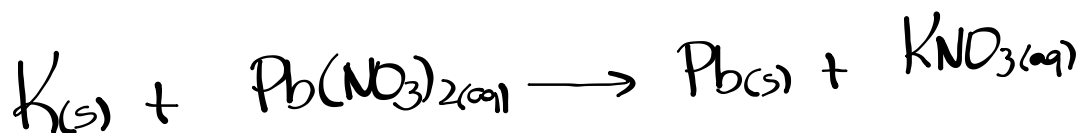
Solutions

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

⇒ <u>solute</u> - substance dissolved

⇒ <u>solvent</u> - substance doing dissolving (liquid)

Ex.　　　　Salt water

　　　　　　solute　　**solvent**

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) ,(l),(g)

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

What happens when an ionic compound dissolves??
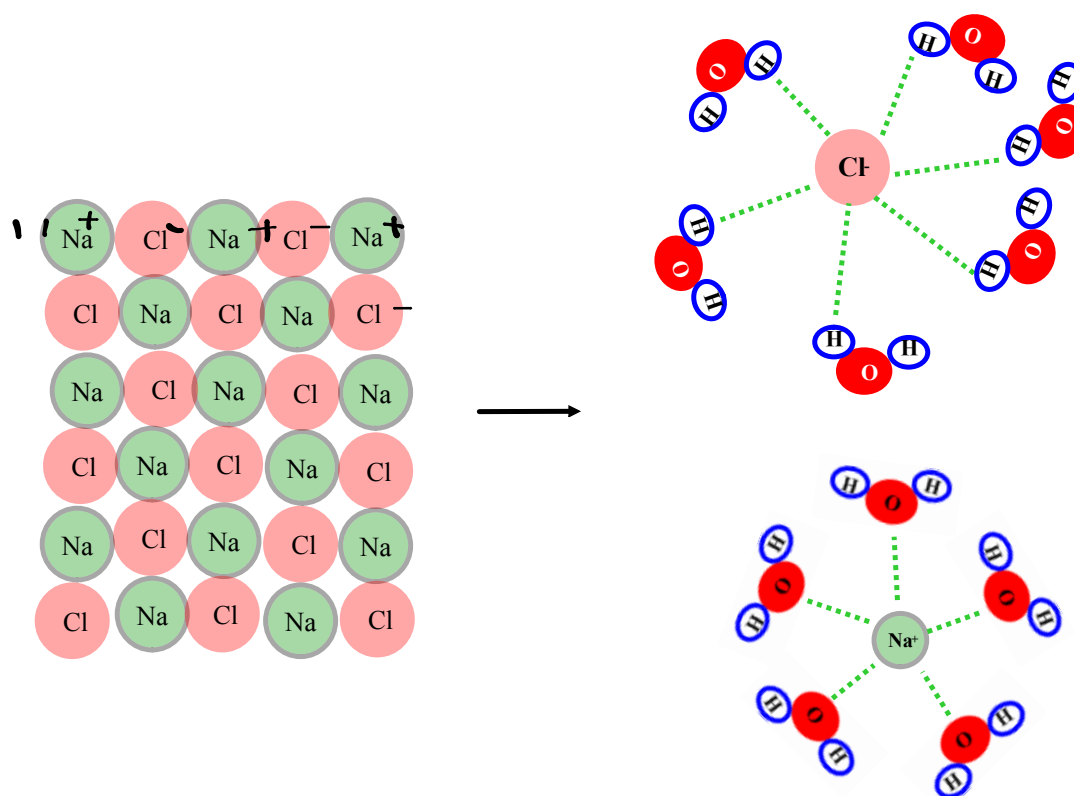
This process is called solvation.

Solubility Rules

- Polar solvents will dissolve ionic compounds and polar compounds
- Nonpolar solvent will dissolve nonpolar compounds
Ex. oil in gasoline

"Like dissolves like"

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
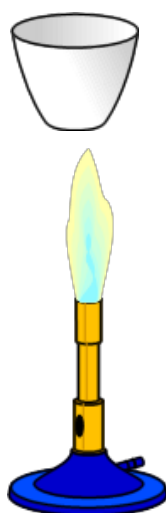
Solubility

30g / 100mL

solubility - concentration of a saturated solution at a room temperature (normally 20°C).

saturated solution - solution at maximum concentration, in which no m solute can be dissolved

supersaturated solution - solution contains more solute than it can theoretically hold at a given temperature

Solubility Generalizations

- solubility of solids increases with an increase in temperature
- solubility of gases decreases with an increase in temperature
- some liquids have no maximum limit of dissolving (**miscible liquids**)
- some liquids will not dissolve in other liquids (**immiscible liquids**)
- as the partial pressure of a gas increases, its solubility increases

Henry's Law

$$\frac{S_1}{P_1} = \frac{S_2}{P_2}$$

0.77 g/L @ 3.5 atm

? @ 1.0 atm

P ↓ (kPa)

$$\frac{0.77 \text{ g/L}}{3.5 \text{ atm}} = \frac{S_2}{1.0 \text{ atm}}$$

$$\frac{(0.77 \text{ g/L})(1.0 \text{ atm})}{(3.5 \text{ atm})} = S_2$$

$$\boxed{S_2 = 0.22 \text{ g/L}}$$

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