Solutions Review
Multiple Choice

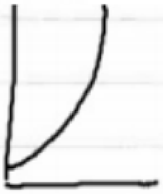
B 1. molarity $M = \frac{\text{\# moles of solute}}{\text{Liters of solution}}$

mass of solvent is required for molality

A 2. the solubility of solids + liquids increase when temp. increases. Gases are the exception - a gas must be cooled to be soluble.

B 3. $M = \frac{\text{\# moles of solute}}{\text{Liters of solution}}$ $m = \frac{\text{\# moles of solute}}{\text{Kilograms of solvent}}$

A 4. a solution containing less solute than
/c expected can be described as weak, unsaturated or dilute.



C 5. a solution of 2 or more metals is an alloy.

A 6. When a substance will not dissolved it can be called insoluble or immiscible

D 7. The rate of dissolving can be increased by
① Heating
② increasing surface area
③ stirring

D8. A solubility curve shows the relationship between temp and quantity of solute that can be dissolved.

B9. $m = \frac{\text{\# of moles of solute}}{\text{Kilograms of Solvent}}$

D10. If mercury is present in an alloy it is called an amalgam.

$0.75g \times \frac{1\,mol}{\underbrace{183.20\,g}_{\text{molar mass}}} = \#\text{ of mol}$

WORD PROBLEMS

$\boxed{M = \frac{\#\text{ of mol }(n)}{L} \quad m = \frac{\#\text{ of mol }(n)}{Kg}}$

16. $\frac{0.75\cancel{g}}{183.2\,\cancel{g}/mol} = 0.0041\,mol\ n$ $\quad \frac{0.0041\,mol}{0.75\,L} = \boxed{0.0055\,M}$

$750\,\cancel{mL} \times \frac{1\ L}{1000\ \cancel{mL}} =$

17. $0.65M = \frac{\#\,mol}{1.5L}$ $\quad 0.975\,\cancel{mol} \times \frac{253.80g}{1\,\cancel{mol}} = 247.46g$ (molar mass)

$M = \frac{moles}{L}$

$\boxed{250g}$

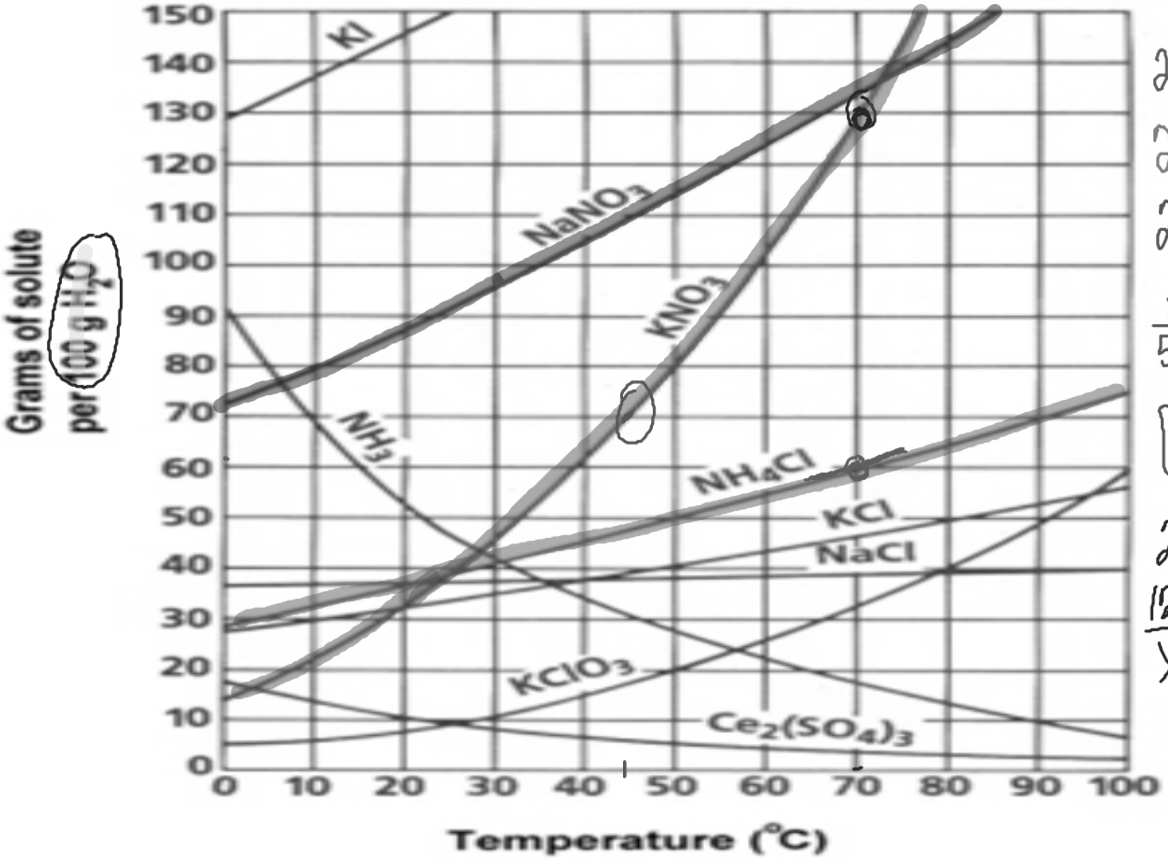
18. $0.020M = \frac{\#\,mol}{0.75\,L}$ $\quad 0.015\,\cancel{mol} \times 36.46\frac{g}{\cancel{mol}} = \boxed{0.55g}$

19. $\frac{220g}{159.8\,g/mol} = 1.38\,mol$ $\quad \frac{1.38\,mol}{8.75\,kg} = \boxed{0.16\,m}$

20. $0.234m = \frac{\#\,mol}{\cancel{8.75\,kg}\ 5.2\,kg} = 1.22\,mol \times \frac{\cancel{44.01g}\ 40.01g}{1\,mol} = \boxed{\cancel{5?}\,g}$ $\boxed{49\,g}$ (mol-mass)

$5200g \times \frac{1\ Kg}{1000\ g} =$

molality
Small g → moles $\quad \frac{moles}{kg}$
lg g → kg



24. 60g

25. 96-98g

26.

$$\frac{x}{50g_{H_2O}} = \frac{70g}{100g\,H_2O}$$

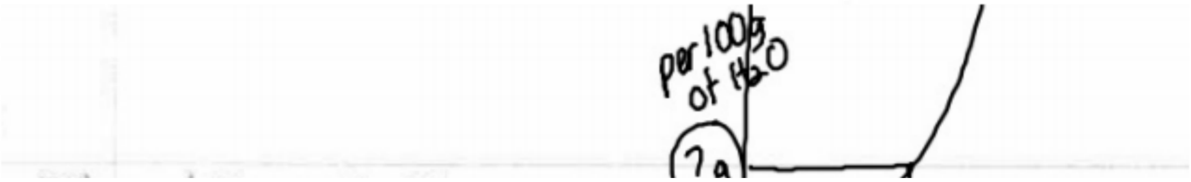
graph

$\boxed{35g}$

27.

$$\frac{120g}{X_{H_2O}} = \frac{130g}{100g}$$

$\boxed{X = 92.3g}$



5/14

Arrhenius - Acids increase the concentration of H^+
Bases increase the concentration of OH^-

Bronsted-Lowry - Acids are the proton donor (H^+)
Bases are the proton acceptor

Conjugate pair - acid & base that have shared a proton.

$\boxed{H_3O^+ \text{ hydronium ion}}$

pH scale $\underbrace{1 \text{———}}_{\text{acid}}\ \underset{\text{neutral}}{\underset{\uparrow}{7}}\ \underbrace{\text{———} 14}_{\text{Base.}}$

indicator = anything that changes color in the presence of an acid or base.

Litmus paper - blue turns red = Acid
red turns blue = Base

acid + base → water + salt

$\underline{H}Cl + Na\underline{OH} \rightarrow HOH + NaCl$

$1\,Kg = 1000g$

$$X g \times \frac{1\,kg}{1000g} = \quad kg$$

$$y\,Kg \times \frac{1000\,g}{1\ Kg} = \quad g$$

$1\,L = 1000ml$

$$\text{given } ml \times \frac{1\ L}{1000\,ml}$$

$$\text{given } L \times \frac{1000\ ml}{1\ L}$$