

Key

- 2. (a) # of atoms = $5.5 \text{ mol} \times \frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mol}} = 3.3 \times 10^{24} \text{ atoms}$
- (b) # of moles = $25.0 \text{ L} \times \frac{1 \text{ mol}}{22.4 \text{ L}} = 1.12 \text{ mol}$
- (c) # of moles = $7.0 \text{ g} \times \frac{1 \text{ mol}}{28 \text{ g}} = 0.25 \text{ mol}$
- (d) # of seconds = $200.0 \text{ coulombs} \times \frac{1 \text{ s}}{35 \text{ coulombs}} = 5.7 \text{ s}$
- (e) # of atmospheres = $4 \times 10^{-8} \text{ kPa} \times \frac{1 \text{ atm}}{101.3 \text{ kPa}} = 4 \times 10^{-10} \text{ atmospheres}$
- (f) # of kilograms = $3.20 \times 10^4 \text{ troy ounce} \times \frac{0.0311 \text{ kg}}{1 \text{ troy ounce}} = 995 \text{ kg}$
- (g) # of milliseconds = $5.0 \times 10^{-4} \text{ s} \times \frac{1 \text{ ms}}{10^{-3} \text{ s}} = 0.50 \text{ ms}$
- (h) # of moles = $15 \text{ 100 kJ} \times \frac{1 \text{ mol}}{5450 \text{ kJ}} = 2.77 \text{ mol}$

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- 17. (a) # of milliseconds = $3 \text{ s} \times \frac{1 \text{ ms}}{10^{-3} \text{ s}} = 3 \times 10^3 \text{ ms}$
- (b) # of litres = $50.0 \text{ mL} \times \frac{10^{-3} \text{ L}}{1 \text{ mL}} = 5.0 \times 10^{-2} \text{ L}$
- (c) # of microlitres = $2 \text{ L} \times \frac{1 \mu\text{L}}{10^{-6} \text{ L}} = 2 \times 10^6 \mu\text{L}$
- (d) # of grams = $25 \text{ kg} \times \frac{10^3 \text{ g}}{1 \text{ kg}} = 2.5 \times 10^4 \text{ g}$
- (e) # of metres = $3 \text{ Mm} \times \frac{10^6 \text{ m}}{1 \text{ Mm}} = 3 \times 10^6 \text{ m}$
- (f) # of decilitres = $2 \text{ L} \times \frac{1 \text{ dL}}{10^{-1} \text{ L}} = 2 \times 10^1 \text{ dL}$
- (g) # of milliseconds = $7 \mu\text{s} \times \frac{10^{-6} \text{ s}}{1 \mu\text{s}} \times \frac{1 \text{ ms}}{10^{-3} \text{ s}} = 7 \times 10^{-3} \text{ ms}$
- (h) # of milligrams = $51 \text{ kg} \times \frac{10^3 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mg}}{10^{-3} \text{ g}} = 5.1 \times 10^7 \text{ mg}$
- (i) # of kilolitres = $3125 \mu\text{L} \times \frac{10^{-6} \text{ L}}{1 \mu\text{L}} \times \frac{1 \text{ kL}}{10^3 \text{ L}} = 3.125 \times 10^{-6} \text{ kL}$
- (j) # of centigrams = $1.7 \mu\text{g} \times \frac{10^{-6} \text{ g}}{1 \mu\text{g}} \times \frac{1 \text{ cg}}{10^{-2} \text{ g}} = 1.7 \times 10^{-4} \text{ cg}$

2

- 31. $d = \frac{m}{V} = \frac{8.19 \text{ g}}{3.50 \text{ mL}} = 2.34 \frac{\text{g}}{\text{mL}}$, or: $d = \frac{8.19 \text{ g}}{3.50 \times 10^{-3} \text{ L}} = 2.34 \times 10^3 \frac{\text{g}}{\text{L}}$
- 32. $V = \frac{m}{d} = \frac{125 \text{ g}}{7.86 \times 10^3 \text{ g/L}} = 0.0159 \text{ L}$
- 33. $m = d \cdot V = 961 \frac{\text{g}}{\text{L}} \times 0.2000 \text{ L} = 192 \text{ g}$
- 34. $V = \frac{m}{d} = \frac{46 \text{ g}}{789 \text{ g/L}} = 0.058 \text{ L}$
- 35. $m = d \cdot V = 0.900 \frac{\text{g}}{\text{L}} \times 22.4 \text{ L} = 20.2 \text{ g}$

3

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5
6
7

56. (a) 6.3 (c) 1.33 (e) 3×10^{14} (g) 202 (i) 20 (k) 2
 (b) 0.000 24 (d) 1.3×10^2 (f) 5.11×10^5 (h) 90 (j) 1×10^{-4} (l) 2.2×10^{-6}

8

17. (a) acetone
 (b) The lower the boiling temperature of a liquid, the higher its vapour pressure.
 (c) The higher the vapour pressure of a liquid, the faster its evaporation rate.
 (d) Iron is known to melt at a very high temperature and to boil at an even higher temperature. The relationship for part (b), above, implies that iron has a very low vapour pressure.
 (e) Since diethyl ether boils at a lower temperature than acetone, the relationship for parts (b) and (c) implies that diethyl ether has a higher vapour pressure and evaporation rate than acetone.

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19. (a) viscosity: hexane < carbon tetrachloride < glycerol
 (b) density: hexane < glycerol < carbon tetrachloride
 (c) There is no relationship between viscosity and density.

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4. (a) $\text{Sn}(\text{SO}_4)_2$ (e) $\text{Hg}_2(\text{NO}_2)_2$ (i) Cr_2O_3 (m) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ (q) $\text{Mg}(\text{MnO}_4)_2$
 (b) $(\text{NH}_4)_2\text{C}_2\text{O}_4$ (f) $\text{Fe}(\text{OH})_3$ (j) MnF_2 (n) Cu_3PO_4 (r) WBr_5
 (c) Li_2O (g) Ag_2SO_4 (k) KH_2PO_4 (o) $\text{Ca}(\text{ClO})_2$ (s) $(\text{NH}_4)_3\text{PO}_4$
 (d) Cu_3N (h) $\text{Pb}(\text{ClO}_4)_2$ (l) $\text{U}(\text{SO}_4)_2$ (p) NaHSO_3 (t) $\text{Hg}(\text{CH}_3\text{COO})_2$

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5. (a) silver phosphate (h) copper(II) sulphate (o) aluminum hydroxide
 (b) aluminum sulphate (i) ammonium sulphide (p) chromium(III) iodide
 (c) iron(III) sulphide (j) ammonium hydrogen carbonate (q) tin(IV) oxide
 (d) copper(I) chloride (k) iron(II) oxalate (r) zinc dichromate
 (e) ammonium carbonate (l) magnesium hydrogen sulphite (s) vanadium(V) oxide
 (f) vanadium(III) chloride (m) lithium chlorite (t) strontium nitride
 (g) mercury(I) carbonate (n) sodium monohydrogen phosphate

12

8. (a) $\text{mass} = 1.00 \text{ mol} \times \frac{53.5 \text{ g}}{1 \text{ mol}} = 53.5 \text{ g}$ (f) $\text{mass} = 2.60 \text{ mol} \times \frac{30.0 \text{ g}}{1 \text{ mol}} = 78.0 \text{ g}$
 (b) $\text{mass} = 4.50 \text{ mol} \times \frac{53.5 \text{ g}}{1 \text{ mol}} = 241 \text{ g}$ (g) $\text{mass} = 3.25 \times 10^2 \text{ mol} \times \frac{17.0 \text{ g}}{1 \text{ mol}} = 5.53 \times 10^3 \text{ g}$
 (c) $\text{mass} = 3.25 \text{ mol} \times \frac{137.5 \text{ g}}{1 \text{ mol}} = 447 \text{ g}$ (h) $\text{mass} = 7.90 \times 10^{-4} \text{ mol} \times \frac{82.1 \text{ g}}{1 \text{ mol}} = 0.0649 \text{ g}$
 (d) $\text{mass} = 0.00355 \text{ mol} \times \frac{142.0 \text{ g}}{1 \text{ mol}} = 0.504 \text{ g}$ (i) $\text{mass} = 1.00 \times 10^{-3} \text{ mol} \times \frac{40.0 \text{ g}}{1 \text{ mol}} = 0.0400 \text{ g}$
 (e) $\text{mass} = 0.0125 \text{ mol} \times \frac{207.3 \text{ g}}{1 \text{ mol}} = 2.59 \text{ g}$ (j) $\text{mass} = 1.75 \times 10^{-4} \text{ mol} \times \frac{55.8 \text{ g}}{1 \text{ mol}} = 9.77 \times 10^{-3} \text{ g}$

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9. (a) # of moles = $17.0 \text{ g} \times \frac{1 \text{ mol}}{98.1 \text{ g}} = 0.173 \text{ mol}$
- (b) # of moles = $91.5 \text{ g} \times \frac{1 \text{ mol}}{18.0 \text{ g}} = 5.08 \text{ mol}$
- (c) # of moles = $53.0 \text{ g} \times \frac{1 \text{ mol}}{12.0 \text{ g}} = 4.42 \text{ mol}$
- (d) # of moles = $1.25 \times 10^{-4} \text{ g} \times \frac{1 \text{ mol}}{95.6 \text{ g}} = 1.31 \times 10^{-6} \text{ mol}$
- (e) # of moles = $4.50 \text{ kg} \times \frac{10^3 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol}}{16.0 \text{ g}} = 281 \text{ mol}$
- (f) # of moles = $225 \text{ g} \times \frac{1 \text{ mol}}{132.1 \text{ g}} = 1.70 \text{ mol}$
- (g) # of moles = $55.2 \text{ mg} \times \frac{10^{-3} \text{ g}}{1 \text{ mg}} \times \frac{1 \text{ mol}}{71.0 \text{ g}} = 7.77 \times 10^{-4} \text{ mol}$
- (h) # of moles = $128.2 \text{ g} \times \frac{1 \text{ mol}}{64.1 \text{ g}} = 2.00 \text{ mol}$
- (i) # of moles = $2955 \text{ kg} \times \frac{10^3 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol}}{107.9 \text{ g}} = 2.739 \times 10^4 \text{ mol}$
- (j) # of moles = $0.0845 \text{ g} \times \frac{1 \text{ mol}}{158.0 \text{ g}} = 5.35 \times 10^{-4} \text{ mol}$

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10. (a) molar mass = $\frac{4.00 \text{ g}}{0.250 \text{ mol}} = 16.0 \text{ g/mol}$
- (b) molar mass = $\frac{0.957 \text{ g}}{0.00248 \text{ mol}} = 386 \text{ g/mol}$
- (c) molar mass = $\frac{7.76 \times 10^{-3} \text{ g}}{6.47 \times 10^{-4} \text{ mol}} = 12.0 \text{ g/mol}$
- (d) molar mass = $\frac{74.8 \text{ g}}{3.44 \times 10^{-5} \text{ mol}} = 2.17 \times 10^6 \text{ g/mol}$

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15. (a) # of moles = $10.6 \text{ L} \times \frac{1 \text{ mol}}{22.4 \text{ L}} = 0.473 \text{ mol}$
- (b) # of moles = $7.50 \times 10^{21} \text{ molecules} \times \frac{1 \text{ mol molecules}}{6.02 \times 10^{23} \text{ molecules}} = 0.0125 \text{ mol}$
- (c) # of moles = $425 \text{ mg} \times \frac{10^{-3} \text{ g}}{1 \text{ mg}} \times \frac{1 \text{ mol}}{74.1 \text{ g}} = 5.74 \times 10^{-3} \text{ mol}$
- (d) # of moles = $4.25 \times 10^{12} \text{ molecule} \times \frac{1 \text{ mol molecules}}{6.02 \times 10^{23} \text{ molecules}} = 7.06 \times 10^{-12} \text{ mol}$
- (e) # of moles = $0.950 \text{ kg} \times \frac{10^3 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol}}{40.0 \text{ g}} = 23.8 \text{ mol}$
- (f) # of moles = $25.0 \text{ mL} \times \frac{10^{-3} \text{ L}}{1 \text{ mL}} \times \frac{1 \text{ mol}}{22.4 \text{ L}} = 1.12 \times 10^{-3} \text{ mol}$
- (g) # of moles = $5.50 \times 10^{25} \text{ molecules} \times \frac{1 \text{ mol molecules}}{6.02 \times 10^{23} \text{ molecules}} = 91.4 \text{ mol}$
- (h) # of moles = $0.120 \text{ L} \times \frac{1 \text{ mol}}{22.4 \text{ L}} = 5.36 \times 10^{-3} \text{ mol}$

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47. density = $\frac{1.59 \text{ g}}{0.850 \text{ L}} = 1.871 \text{ g/L}$, and mass of 1 mol = $1.871 \frac{\text{g}}{\text{L}} \times 22.4 \text{ L} = 41.9 \text{ g}$

empirical mass of $\text{CH}_2 = 12.0 + 2 \times 1.0 = 14.0 \text{ g}$

$N = \frac{41.9 \text{ g}}{14.0 \text{ g}} = 2.99$. Therefore the molecular formula = $3 \times (\text{CH}_2) = \text{C}_3\text{H}_6$.

17 ~~17~~

48. moles N = $30.4 \text{ g} \times \frac{1 \text{ mol}}{14.0 \text{ g}} = 2.17 \text{ mol}$ | 1

moles O = $69.6 \text{ g} \times \frac{1 \text{ mol}}{16.0 \text{ g}} = 4.35 \text{ mol}$ | 2

and empirical formula = NO_2 , empirical mass = $14.0 + 2 \times 16.0 = 46.0 \text{ g}$

molar mass = $4.11 \frac{\text{g}}{\text{L}} \times 22.4 \text{ L} = 92.1 \text{ g}$

$N = \frac{92.1 \text{ g}}{46.0 \text{ g}} = 2.0$. Therefore the molecular formula = $2 \times (\text{NO}_2) = \text{N}_2\text{O}_4$.

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49. Empirical mass of $\text{C}_5\text{H}_{11} = 71.0 \text{ g}$

molar mass = $\frac{3.91 \text{ g}}{0.0275 \text{ mol}} = 142 \text{ g/mol}$

$N = \frac{142 \text{ g}}{71.0 \text{ g}} = 2.0$. Therefore the molecular formula = $2 \times (\text{C}_5\text{H}_{11}) = \text{C}_{10}\text{H}_{22}$.

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50. density = $\frac{0.522 \text{ g}}{0.450 \text{ L}} = 1.16 \text{ g/L}$, and mass of 1 mol = $1.16 \frac{\text{g}}{\text{L}} \times 22.4 \text{ L} = 26.0 \text{ g}$

empirical mass = $1 \times 12.0 + 1 \times 1.0 = 13.0 \text{ g}$

$N = \frac{26.0 \text{ g}}{13.0 \text{ g}} = 2.0$. Therefore the molecular formula = $2 \times (\text{CH}) = \text{C}_2\text{H}_2$.

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59. (a) $[\text{HCl}] = \frac{0.26 \text{ mol}}{1.0 \text{ L}} = 0.26 \text{ M}$

(b) $[\text{HNO}_3] = \frac{2.8 \text{ mol}}{4.0 \text{ L}} = 0.70 \text{ M}$

(c) $[\text{NH}_4\text{Cl}] = \frac{0.0700 \text{ mol}}{0.0500 \text{ L}} = 1.40 \text{ M}$

(d) $[\text{NaCl}] = \frac{25.0 \text{ g}}{0.2500 \text{ L}} \times \frac{1 \text{ mol}}{58.5 \text{ g}} = 1.71 \text{ M}$

(e) $[\text{CoBr}_2 \cdot 6\text{H}_2\text{O}] = \frac{1.50 \text{ g}}{0.6000 \text{ L}} \times \frac{1 \text{ mol}}{326.7 \text{ g}} = 0.00765 \text{ M}$

(f) $[\text{Cr}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}] = \frac{10.0 \text{ g}}{0.325 \text{ L}} \times \frac{1 \text{ mol}}{400.0 \text{ g}} = 0.0769 \text{ M}$

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$$61. \text{ moles AlCl}_3 = 0.250 \frac{\text{mol}}{\text{L}} \times 0.3500 \text{ L} = 0.0875 \text{ mol}$$

22

$$62. \text{ moles HCl} = 100.0 \text{ g} \times \frac{1 \text{ mol}}{36.5 \text{ g}} = 2.74 \text{ mol}$$

$$c = \frac{n}{V}, \text{ so } V = \frac{n}{c} = \frac{2.74 \text{ mol}}{2.40 \text{ mol/L}} = 1.14 \text{ L}$$

23

$$66. [\text{CH}_3\text{COOH}] = 1049 \frac{\text{g}}{\text{L}} \times \frac{1 \text{ mol}}{60.0 \text{ g}} = 17.5 \text{ M}$$

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$$67. d = 17.6 \frac{\text{mol}}{\text{L}} \times \frac{100.5 \text{ g}}{1 \text{ mol}} = 1.77 \times 10^3 \frac{\text{g}}{\text{L}}$$

25

$$97. \text{ (a) } [\text{LiOH}]_{\text{DIL}} (\#1) = 3.55 \text{ M} \times \frac{125 \text{ mL}}{600 \text{ mL}} = 0.740 \text{ M}$$

$$[\text{LiOH}]_{\text{DIL}} (\#2) = 2.42 \text{ M} \times \frac{475 \text{ mL}}{600 \text{ mL}} = 1.92 \text{ M}$$

$$[\text{LiOH}] (\text{total}) = 0.740 \text{ M} + 1.92 \text{ M} = 2.66 \text{ M}$$

$$\text{ (b) } [\text{NaCl}] = 0.250 \text{ M} \times \frac{200.0 \text{ mL}}{350.0 \text{ mL}} = 0.143 \text{ M}$$

$$\text{ (c) } [\text{KBr}]_{\text{DIL}} (\#1) = 12.0 \text{ M} \times \frac{100.0 \text{ mL}}{1050.0 \text{ mL}} = 1.14 \text{ M}$$

$$[\text{KBr}]_{\text{DIL}} (\#2) = 0.200 \text{ M} \times \frac{950.0 \text{ mL}}{1050.0 \text{ mL}} = 0.181 \text{ M}$$

$$[\text{KBr}] (\text{total}) = 1.14 \text{ M} + 0.181 \text{ M} = 1.32 \text{ M}$$

$$\text{ (d) } [\text{KBr}] = 2.50 \text{ M} \times \frac{5.0 \text{ mL}}{80 \text{ mL}} = 0.16 \text{ M}$$

$$\text{ (e) } [\text{HCl}] = 0.1105 \text{ M} \times \frac{850.0 \text{ mL}}{900.0 \text{ mL}} = 0.1044 \text{ M}$$

$$\text{ (f) } [\text{HCl}]_{\text{DIL}} (\#1) = 0.125 \text{ M} \times \frac{50.0 \text{ mL}}{125.0 \text{ mL}} = 0.0500 \text{ M}$$

$$[\text{HCl}]_{\text{DIL}} (\#2) = 0.350 \text{ M} \times \frac{75.0 \text{ mL}}{125.0 \text{ mL}} = 0.210 \text{ M}$$

$$[\text{HCl}] (\text{total}) = 0.0500 \text{ M} + 0.210 \text{ M} = 0.260 \text{ M}$$

26

$$6. \text{ (a) mass of NO} = 2.00 \text{ mol NH}_3 \times \frac{4 \text{ mol NO}}{4 \text{ mol NH}_3} \times \frac{30.0 \text{ g NO}}{1 \text{ mol NO}} = 60.0 \text{ g}$$

$$\text{ (b) mass of H}_2\text{O} = 4.00 \text{ mol O}_2 \times \frac{6 \text{ mol H}_2\text{O}}{5 \text{ mol O}_2} \times \frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 86.4 \text{ g}$$

$$\text{ (c) volume of NH}_3 = 3.00 \text{ mol O}_2 \times \frac{4 \text{ mol NH}_3}{5 \text{ mol O}_2} \times \frac{22.4 \text{ L NH}_3}{1 \text{ mol NH}_3} = 53.8 \text{ L}$$

$$\text{ (d) volume of NH}_3 = 0.750 \text{ mol H}_2\text{O} \times \frac{4 \text{ mol NH}_3}{6 \text{ mol H}_2\text{O}} \times \frac{22.4 \text{ L NH}_3}{1 \text{ mol NH}_3} = 11.2 \text{ L}$$

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7. (a) mass of $\text{CO}_2 = 100.0 \text{ g C}_5\text{H}_{12} \times \frac{1 \text{ mol C}_5\text{H}_{12}}{72.0 \text{ g C}_5\text{H}_{12}} \times \frac{5 \text{ mol CO}_2}{1 \text{ mol C}_5\text{H}_{12}} \times \frac{44.0 \text{ g CO}_2}{1 \text{ mol CO}_2} = 306 \text{ g}$

(b) mass of $\text{O}_2 = 60.0 \text{ g H}_2\text{O} \times \frac{1 \text{ mol H}_2\text{O}}{18.0 \text{ g H}_2\text{O}} \times \frac{8 \text{ mol O}_2}{6 \text{ mol H}_2\text{O}} \times \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = 142 \text{ g}$

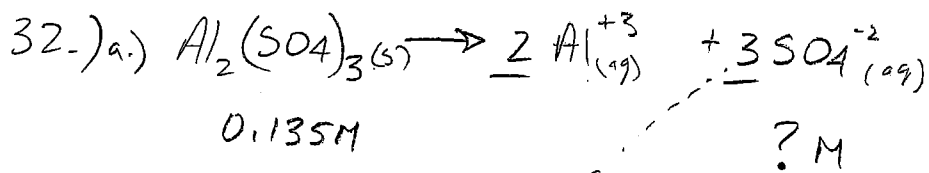
(c) mass of $\text{C}_5\text{H}_{12} = 90.0 \text{ L CO}_2 \times \frac{1 \text{ mol CO}_2}{22.4 \text{ L CO}_2} \times \frac{1 \text{ mol C}_5\text{H}_{12}}{5 \text{ mol CO}_2} \times \frac{72.0 \text{ g C}_5\text{H}_{12}}{1 \text{ mol C}_5\text{H}_{12}} = 57.9 \text{ g}$

(d) volume of $\text{O}_2 = 70.0 \text{ g CO}_2 \times \frac{1 \text{ mol CO}_2}{44.0 \text{ g CO}_2} \times \frac{8 \text{ mol O}_2}{5 \text{ mol CO}_2} \times \frac{22.4 \text{ L O}_2}{1 \text{ mol O}_2} = 57.0 \text{ L}$

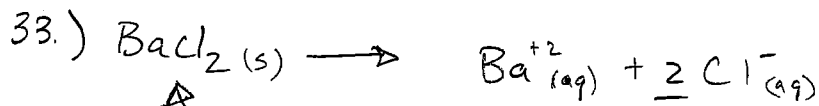
(e) volume of $\text{O}_2 = 48.0 \text{ L CO}_2 \times \frac{1 \text{ mol CO}_2}{22.4 \text{ L CO}_2} \times \frac{8 \text{ mol O}_2}{5 \text{ mol CO}_2} \times \frac{22.4 \text{ L O}_2}{1 \text{ mol O}_2} = 76.8 \text{ L}$

(f) mass of $\text{H}_2\text{O} = 106 \text{ L CO}_2 \times \frac{1 \text{ mol CO}_2}{22.4 \text{ L CO}_2} \times \frac{6 \text{ mol H}_2\text{O}}{5 \text{ mol CO}_2} \times \frac{18.0 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 102 \text{ g}$

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$$\frac{0.135 \text{ mol Al}_2(\text{SO}_4)_3}{1 \text{ L}} \times \frac{3 \text{ mol SO}_4^{-2}}{1 \text{ mol Al}_2(\text{SO}_4)_3} = \boxed{\frac{0.405 \text{ mol SO}_4^{-2}}{1 \text{ L}}}$$



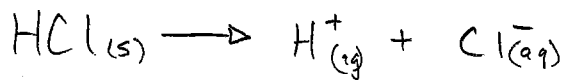
$$10.0 \text{ g BaCl}_2 \times \frac{1 \text{ mol BaCl}_2}{208.2 \text{ g BaCl}_2} \times \frac{1}{0.600 \text{ L}} = 0.08005 \text{ M}$$

$$\frac{0.08005 \text{ mol BaCl}_2}{1 \text{ L}} \times \frac{2 \text{ mol Cl}^{-}}{1 \text{ mol BaCl}_2} = \boxed{0.160 \text{ M Cl}^{-}}$$

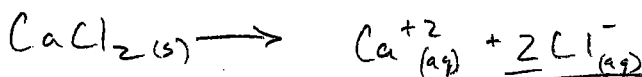
$$34.) 0.055 \text{ L} \times \frac{0.300 \text{ mol HCl}}{1 \text{ L}} \times \frac{1}{0.135 \text{ L}} = \underline{0.1222 \text{ M HCl}}$$

$$C_{\text{conc}} V_{\text{conc}} = C_{\text{dil}} V_{\text{dil}} \quad / \quad (0.550)(80.0) = (C_{\text{conc}})(1350)$$

$$\underline{C_{\text{conc}} = 0.3259 \text{ M CaCl}_2}$$

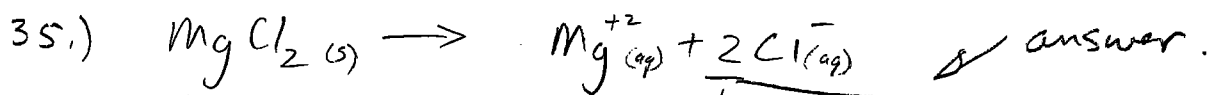


$$0.122 \text{ M} \quad 0.122 \text{ M} \quad \boxed{0.122 \text{ M}}$$



$$0.3259 \text{ M} \quad 0.3259 \text{ M} \quad \boxed{0.652 \text{ M}}$$

$$+ \quad = \boxed{0.774 \text{ M Cl}^{-}}$$



$$0.318\text{M} \quad 0.318\text{M} \quad \boxed{0.636\text{M}}$$

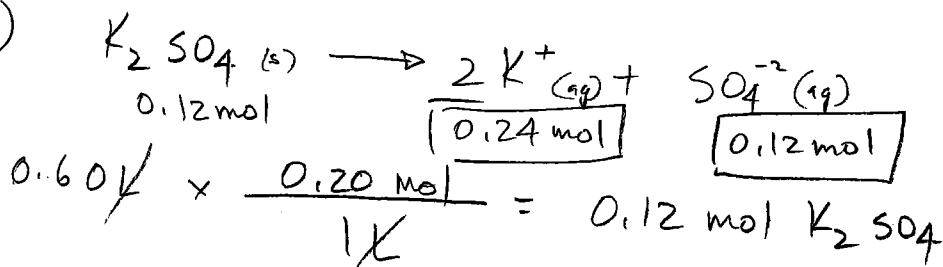
$$0.350\cancel{\text{L}} \times \frac{0.350\text{ mol MgCl}_2}{1\cancel{\text{L}}} \times \frac{1}{0.275\text{L}} = \underline{0.31818\text{M MgCl}_2}$$

OR

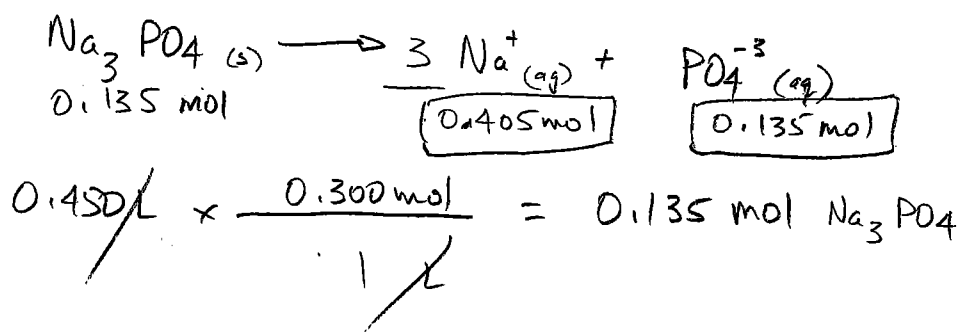
$$C_{\text{conc}} V_{\text{con}} = C_{\text{dil}} V_{\text{dil}} \quad / \quad (0.250)(0.350) = (C_{\text{conc}})(0.275)$$

$$\underline{C_{\text{conc}} = 0.31818\text{M MgCl}_2}$$

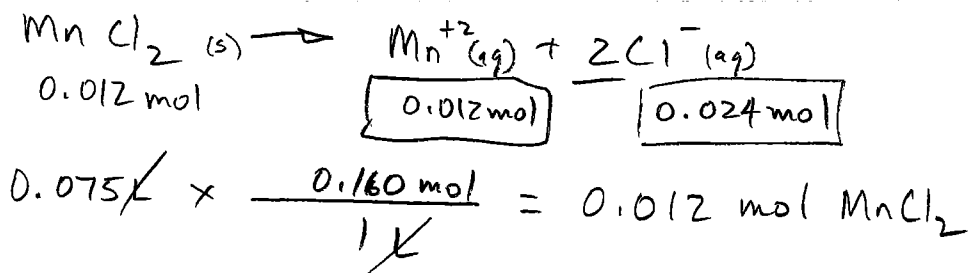
36.) a.)



b.)



c.)



d.)

