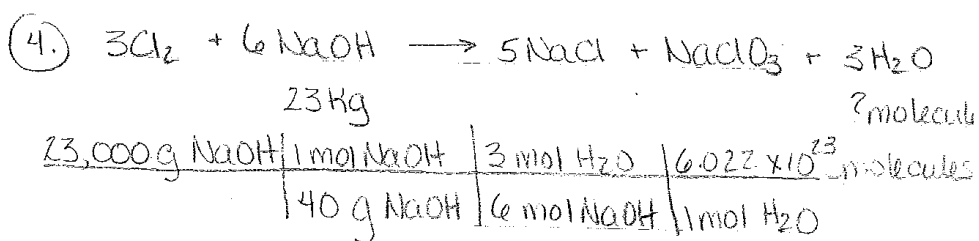
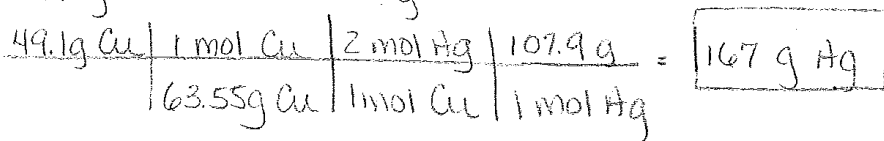
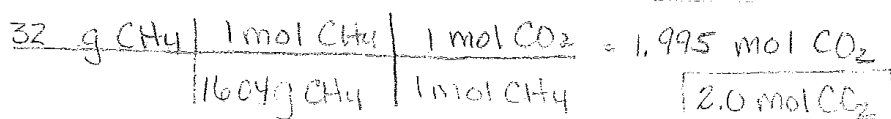
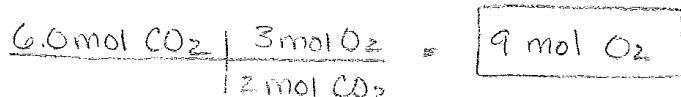
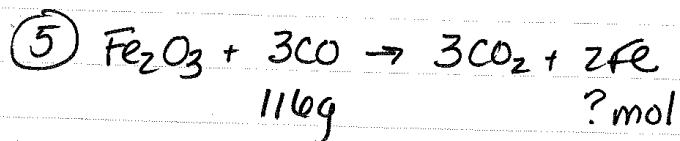


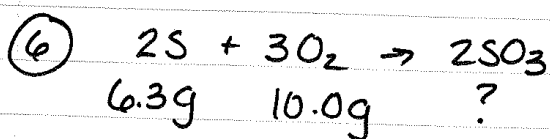
Chemistry Review



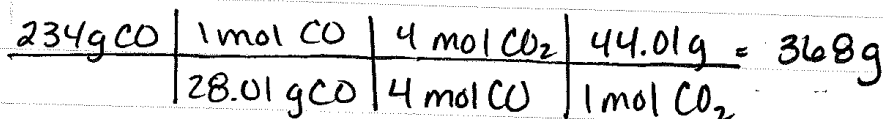
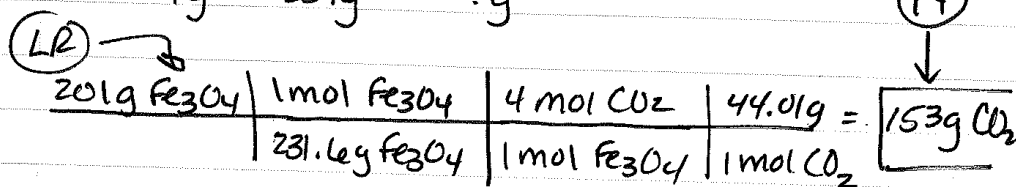
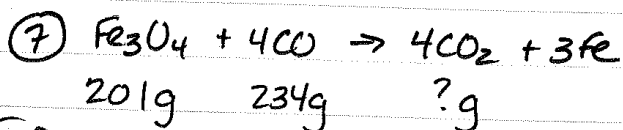
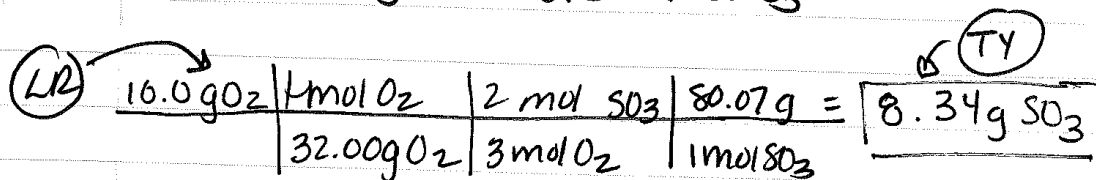
$$= 1.7 \times 10^{26} \text{ molecules H}_2\text{O}$$



$$\frac{116\text{g CO}}{28.01\text{g CO}} \times \frac{1\text{mol CO}}{3\text{mol CO}} \times \frac{2\text{mol Fe}}{1\text{mol Fe}} = \boxed{2.76\text{ mol Fe}}$$



$$\frac{6.3\text{g S}}{32.07\text{g S}} \times \frac{1\text{mol S}}{2\text{mol S}} \times \frac{2\text{mol SO}_3}{1\text{mol SO}_3} \times 80.07 = 16\text{g SO}_3$$



(8) 2 electrons

(9) a) $18e^-$ b) $2e^-$ c) $2e^-$

(10) 3 unpaired e^-

(11) O $1s^2 2s^2 2p^4$

(12) S

(13) $1e^-$

(14) 8 valence e^-

(15) $6e^-$ in d, 6 in p, 2 in s = $14e^-$ total

(16) Ni

(17) 3

(18) P

(19) lose, positive

loses
electron

(20) Ca

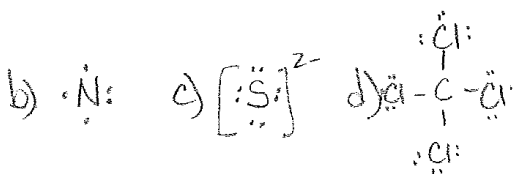
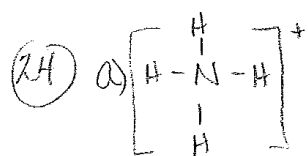
(21) ionic - e^- transferred
covalent - shared

(22) HCl - PC
NaCl - I

CCl_4 - PC
 SO_2 - PC

O_2 - C

(23) Argon



(25) $V_1 = 650. \text{ mL}$

$V_2 = ?$

$T_1 = 273 \text{ K}$

$T_2 = 273$

$P_1 = 1 \text{ atm} = 760 \text{ torr}$

$P_2 = 950. \text{ torr}$

$$P_1 V_1 = P_2 V_2$$

$$(650)(760) = V_2 (950)$$

$$520 \text{ mL} = V_2$$

(26) $V_1 = 6.5 \text{ L}$

$V_2 = 13.0 \text{ L}$

$T_1 = 25^\circ \text{C}$

$T_2 = 25^\circ \text{C}$

$P_1 = 1.5 \text{ atm}$

$P_2 = ?$

$$(1.5) 6.5 = 13.0 P_2$$

$$P_2 = 0.75 \text{ atm}$$

(27) -273°C or 0K

(28) $V_1 = ?$ $V_2 = 285\text{ mL}$
 $T_1 = 35^{\circ}\text{C} + 273 = 308$ $T_2 = 100^{\circ}\text{C} = 373\text{ K}$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2} \quad V_1 = \frac{(285)(308)}{373} = \boxed{235\text{ mL}}$$

(29) $V_1 = 10.1\text{ L}$ $V_2 = 12.2\text{ L}$
 $P_1 = 0.925\text{ atm}$ $P_2 = 625\text{ torr} / 760 = 0.822\text{ atm}$
 $T_1 = 25^{\circ}\text{C} + 273 = 298$ $T_2 = ?$

$$\frac{T_1}{P_1 V_1} = \frac{T_2}{P_2 V_2} \quad \frac{298(0.822)(12.2)}{(10.1)(0.925)} = T_2 = \boxed{\begin{matrix} 320.\text{ K} \\ 47^{\circ}\text{ C} \end{matrix}}$$

(30) $V_1 = 251\text{ mL}$ $V_2 = ?$
 $T_1 = 273\text{ K}$ $T_2 = 45^{\circ}\text{C} + 273 = 318$
 $P_1 = 1\text{ atm}$ $P_2 = 1.10\text{ atm}$

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2} \quad \frac{(318)(1)(251)}{(1.10)(273)} = V_2 = \boxed{266\text{ mL}}$$

$$(31) P = P_{H_2O} + P_g$$

$$762 = 17 + ?$$

$$P_g = \boxed{745 \text{ torr}}$$

$$(32) V_1 = ?$$

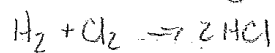
$$T_1 = 273$$

$$P = 1 \text{ atm}$$

$$n = ? = 0.1124$$

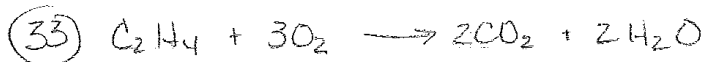
$$PV = nRT$$

$$\frac{4.00 \text{ g Cl}_2}{70.9 \text{ g Cl}_2} \times \frac{1 \text{ mol Cl}_2}{70.9 \text{ g Cl}_2} = 0.0564 \text{ mol Cl}_2$$



$$\frac{0.0564 \text{ mol Cl}_2}{1 \text{ mol Cl}_2} \times \frac{2 \text{ mol HCl}}{1 \text{ mol Cl}_2} = 0.1124$$

$$V = \frac{(0.1124)(0.0821)(273)}{(1 \text{ atm})} = \boxed{2.52 \text{ L}}$$



$$V_{O_2} = ?$$

$$T = 273 \text{ K}$$

$$P = 1 \text{ atm}$$

$$n = 4.5 \text{ mol}$$

$$n = 1.5 \text{ mol } C_2H_4$$

$$\frac{1.5 \text{ mol } C_2H_4}{1 \text{ mol } C_2H_4} \times \frac{3 \text{ mol } O_2}{1 \text{ mol } C_2H_4} = \boxed{4.5 \text{ mol } O_2}$$

$$V = \frac{nRT}{P} = \frac{4.5(0.0821)(273)}{1 \text{ atm}} = \boxed{101 \text{ L}}$$

(34) 40.0% NaOH .40(454) = 182g
 454g solution

(35) 100.0g HNO₃ 70.0% HNO₃ by mass

$$\frac{70.0g}{63.0} \times \frac{1 \text{ mol}}{1} = \text{1.1 mol HNO}_3$$

(36) $\frac{1.00 \times 10^2 \text{ mL}}{1000 \text{ mL}} \times \frac{1 \text{ L}}{1} = 0.1 \text{ L H}_2\text{SO}_4$

$$0.1 \text{ L} \times \frac{0.200 \text{ mol}}{1 \text{ Liter}} \times \frac{98.02 \text{ g}}{1 \text{ mol H}_2\text{SO}_4} = \text{1.96g}$$

(37) $\frac{200.1g \text{ NaOH}}{39.99g} \times \frac{1 \text{ mol}}{1} = 5.003 \text{ mol NaOH}$
 851 mL soln.

$$\frac{5.003 \text{ mol}}{.851 \text{ L}} = \text{5.88M NaOH}$$

(34) 40.0% NaOH 40(454) = 182g
 454g solution

(35) 100.0g HNO₃ 70.0% HNO₃ by mass

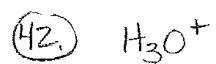
$$\frac{70.0g}{63.0} \times \frac{1 \text{ mol}}{1} = \boxed{1.11 \text{ mol HNO}_3}$$

(36) $\frac{1.00 \times 10^2 \text{ mL}}{1000 \text{ mL}} \times \frac{1 \text{ L}}{1} = 0.1 \text{ L H}_2\text{SO}_4$

$$0.1 \text{ L} \times \frac{0.200 \text{ mol}}{1 \text{ Liter}} \times \frac{98.02 \text{ g}}{1 \text{ mol H}_2\text{SO}_4} = \boxed{1.96 \text{ g}}$$

(37) $\frac{200.1 \text{ g NaOH}}{39.99 \text{ g}} \times \frac{1 \text{ mol}}{1} = 5.003 \text{ mol NaOH}$
 851 mL soln.

$$\frac{5.003 \text{ mol}}{.851 \text{ L}} = \boxed{5.88 \text{ M NaOH}}$$



43. $[\text{H}^+] = 1.5 \times 10^{-7}$ $[\text{OH}^-] = 6.7 \times 10^{-8}$

44. $\text{pH} = 2.30$ $[\text{H}^+] = 5.0 \times 10^{-3}$

45. $[\text{OH}^-] = 3.4 \times 10^{-5}$ $\text{pH} = 9.53$

46. $[\text{H}^+] = 2.0 \times 10^{-5}$ $\text{pOH} = 9.30$