1. $742\ mmHg - 42.2\ mmHg = 699.8\ mmHg$

2. $615\ mmHg - 23.8\ mmHg = 591.2\ mmHg = P_1$

$V_1 = 200\ ml \quad T_1 = 298\ K$

$T_2 = 273\ K \quad P_2 = 760\ mmHg \quad V_2 = ?$

$P_1 V_1 T_2 = P_2 V_2 T_1$

$$\frac{(591.2\ mmHg)(200\ ml)(273\ K)}{(760\ mmHg)(298\ K)} = \frac{(760\ mmHg)(V_2)(298\ K)}{(760\ mmHg)(298\ K)}$$

$142.53\ ml = V_2$

3. $PV = nRT$

a. $$\frac{(P)(2.5\ L)}{2.5\ L} = \frac{(1.35\ mol)(.0821\ L\cdot ATM/mol\ K)(320\ K)}{2.5\ L}$$

$P = 14.19\ ATM$

b. $$\frac{P(4.75\ L)}{(4.75\ L)} = \frac{(1.86\ mol)(.0821\ L\cdot ATM/mol\ K)(300\ K)}{4.75\ L}$$

$P = 4.46\ ATM$

c. $$\frac{P(.75\ L)}{(.75\ L)} = \frac{(2.15\ mol)(.0821\ L\cdot ATM/mol\ K)(330\ K)}{(.75\ L)}$$

$P = 77.67\ ATM$

Ch 13

$PV = nRT$

4. a. $\frac{(1.25\ \text{atm})(V)}{(1.25\ \text{atm})} = \frac{(2\ \text{mol})(.0821\ \frac{\text{L·atm}}{\text{mol·K}})(300\ \text{K})}{(1.25\ \text{atm})}$

$V = 39.41\ \text{L}$

b. $\frac{(.7237\ \text{atm})(V)}{.7237\ \text{atm}} = \frac{(.125\ \text{mol})(.0821\ \frac{\text{L·atm}}{\text{mol·K}})(310\ \text{K})}{.7237\ \text{atm}}$

$550\ \text{mmHg} \times \frac{1\ \text{atm}}{760\ \text{mmHg}} = .7237\ \text{atm}$

$V = 14.95\ \text{L}$

c. $(4.0\ \text{g}\ O_2)\left(\frac{1\ \text{mol}}{32.00\ \text{g}}\right) = .125\ \text{mol}\ O_2$

$\left(675\ \text{mmHg}\right)\left(\frac{1\ \text{atm}}{760\ \text{mmHg}}\right) = .8882\ \text{atm}$

$\frac{(.8882\ \text{atm})(V)}{(.8882\ \text{atm})} = \frac{(.125\ \text{mol})(.0821\ \frac{\text{L·atm}}{\text{mol·K}})(330\ \text{K})}{(.8882\ \text{atm})}$

$V = 3.81\ \text{L}$

$PV = nRT$

5. a. $\frac{(1.06\ \text{atm})(1.25\ \text{K})}{(.0821\ \frac{\text{L·atm}}{\text{mol·K}})(250\ \text{K})} = \frac{n(.0821\ \frac{\text{L·atm}}{\text{mol·K}})(250\ \text{K})}{(.0821\ \frac{\text{L·atm}}{\text{mol·K}})(250\ \text{K})}$

$.065\ \text{mol} = n$

Ch 14 HW3

$PV = nRT$

5. b. $\frac{(.926\ atm)(.8\ L)}{(.0821\ \frac{L \cdot atm}{mol\ K})(300K)} = \frac{n(.0821\ \frac{L \cdot atm}{mol\ K})(300K)}{(.0821\ \frac{L \cdot atm}{mol\ K})(300K)}$

$.03\ mol = n$

c. $\frac{(700\ mmHg)(1\ atm)}{(760\ mmHg)} = .921\ atm$

$\frac{(.921\ atm)(.75\ L)}{(.0821\ \frac{L \cdot atm}{mol\ K})(223K)} = \frac{n(.0821\ \frac{L \cdot atm}{mol\ K})(223K)}{(.0821\ \frac{L \cdot atm}{mol\ K})(223K)}$

$.038\ mol = n$

$PV = nRT$

6. a. $\frac{(1.75\ atm)(5.6\ L)}{(.0821\ \frac{L \cdot atm}{mol\ K})(250K)} = \frac{n(.0821\ \frac{L \cdot atm}{mol\ K})(250K)}{(.0821\ \frac{L \cdot atm}{mol\ K})(250K)}$

$.477\ mol\ O_2 = n$

$(.477\ mol)\left(\frac{32g}{mol}\right) = 15.28\ g\ O_2$

c. $\frac{(.921\ atm)(3.5L)}{(.0821\ \frac{L \cdot atm}{mol\ K})(300K)} = \frac{n(.0821\ \frac{L \cdot atm}{mol\ K})(300K)}{(.0821\ \frac{L \cdot atm}{mol\ K})(300K)}$

$1 \cdot 14.01g$
$3 \cdot 1.00g$
$17.04g$

$.131\ mol\ NH_3 = n$

$(.131\ mol\ NH_3)\left(\frac{17.04g}{mol}\right) = 12.23\ g\ NH_3$

Ch 4 HW3

$PV = nRT$

6. c. $(625\ \text{mmHg})\left(\frac{1\ \text{atm}}{760\ \text{mmHg}}\right) = .822\ \text{atm}$

$$\frac{(.822\ \text{atm})(.125\ \text{L})}{\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(220\ \text{K})} = \frac{n\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(220\ \text{K})}{\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(220\ \text{K})}$$

$.0057\ \text{mol}\ SO_2$

$\frac{(1\cdot 32.06\ \text{g}) + (2\cdot 16.00\ \text{g})}{64.06\ \text{g}}$

$(.0057\ \text{mol}\ SO_2)\left(\frac{64.06\ \text{g}}{\text{mol}}\right) = .37\ \text{g}\ SO_2$

$.37\ \text{g}$

7. a. $\frac{(1.14\ \text{atm})(1.12\ \text{L})}{\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(280\ \text{K})} = \frac{n\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(280\ \text{K})}{\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(280\ \text{K})}$

$.0555\ \text{mol} = n$

$\frac{1.65\ \text{g}}{.0555\ \text{mol}} = \boxed{11.70\ \text{g/mol}}$

b. $\frac{(.84\ \text{atm})(2.35\ \text{L})}{\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(310\ \text{K})} = \frac{n\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(310\ \text{K})}{\left(.0821\ \frac{\text{L·atm}}{\text{mol·K}}\right)(310\ \text{K})}$

$.0776\ \text{mol} = n$

$\frac{1.05\ \text{g}}{.0776\ \text{mol}} = \boxed{13.53\ \text{g/mol}}$

7. C. $\left(785\ \text{mmHg}\right)\left(\frac{1\ \text{ATM}}{760\ \text{mmHg}}\right) = 1.033\ \text{ATM}$

$$\frac{(1.033\ \text{ATM})(.75\text{L})}{(.0821\ \frac{\text{L}\cdot\text{ATM}}{\text{mol}\cdot\text{K}})(250\text{K})} = \frac{n(.0821\ \frac{\text{L}\cdot\text{ATM}}{\text{mol}\cdot\text{K}})(250\text{K})}{(.0821\ \frac{\text{L}\cdot\text{ATM}}{\text{mol}\cdot\text{K}})(250\text{K})}$$

$$.0377\ \text{mol} = n$$

$$\frac{.432\text{g}}{.0377\ \text{mol}} = \boxed{11.46\ \frac{\text{g}}{\text{mol}}}$$

8. $\left(620\ \text{mmHg}\right)\left(\frac{1\ \text{ATM}}{760\ \text{mmHg}}\right) = .8158\ \text{ATM}$

$$\frac{(.8158\ \text{ATM})(20\text{L})}{(.0821\ \frac{\text{L}\cdot\text{ATM}}{\text{mol}\cdot\text{K}})(298\text{K})} = \frac{n(.0821\ \frac{\text{L}\cdot\text{ATM}}{\text{mol}\cdot\text{K}})(298\text{K})}{(.0821\ \frac{\text{L}\cdot\text{ATM}}{\text{mol}\cdot\text{K}})(298\text{K})}$$

$$\boxed{.667\ \text{mol} = n}$$

9. $\left(25\text{g CH}_4\right)\left(\frac{1\ \text{mol}}{16.05\text{g}}\right) = 1.558\ \text{mol CH}_4$

$$\frac{(.82\ \text{ATM})(V)}{.82\ \text{ATM}} = \frac{(1.558\ \text{mol})(.0821\ \frac{\text{L}\cdot\text{ATM}}{\text{mol}\cdot\text{K}})(303\text{K})}{.82\ \text{ATM}}$$

Ch 4 HW 3

10. $\frac{(1\,atm)(.015L)}{(5\,mol)(.0821\frac{L\cdot atm}{mol\cdot K})} = \frac{(5\,mol)(.0821\frac{L\cdot atm}{mol\cdot K})(T)}{(5\,mol)(.0821\frac{L\cdot atm}{mol\cdot K})}$

$.037\,K = T$

11. $\frac{(.8158\,atm)(4L)}{(.0821\frac{L\cdot atm}{mol\cdot K})(296K)} = \frac{n(.0821\frac{L\cdot atm}{mol\cdot K})(296K)}{(.0821\frac{L\cdot atm}{mol\cdot K})(296K)}$

$.134\,mol = n$

12. $2H_2 + O_2 \rightarrow 2H_2O$

$(.134\,mol\,H_2)\frac{(2\,mol\,H_2O)}{(2\,mol\,H_2)} = .134\,mol\,H_2O$

$\frac{P(4L)}{4L} = \frac{(.134\,mol)(.0821\frac{L\cdot atm}{mol\cdot K})(2273K)}{4L}$

$P = 6.25\,atm$

13. $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

$5L\,C_3H_8\,@\,STP \Rightarrow (5L)\frac{(1\,mol)}{22.4L} = .2232\,mol\,C_3H_8$

$(.2232\,mol\,C_3H_8)\frac{(4\,mol\,H_2O)}{(1\,mol\,C_3H_8)} = .8928\,mol\,H_2O = n$

$1500°F \Rightarrow °C = \frac{°F-32}{1.8} = \frac{1500-32}{1.8}$

$°C = 815.56 = 1088.56K$

13. (CON'T.)

$$\frac{(.8158\ atm)(V)}{.8158\ atm} = \frac{(.8928\ mol)(.0821\ \frac{L \cdot atm}{mol \cdot K})(1088.56K)}{.8158\ atm}$$

$$V = 97.81\ L$$

14. $$\frac{(.8\ atm)(.5L)}{(.0821\ \frac{L \cdot atm}{mol \cdot K})(295.22K)} = \frac{n(.0821\ \frac{L \cdot atm}{mol \cdot K})(295.22K)}{(.0821\ \frac{L \cdot atm}{mol \cdot K})(295.22K)}$$

$$.017\ mol = n$$

$\frac{72-32}{1.8} = °C$

$22.22 = °C$

-273

$295.22K$