

Homework No.1

1. Calculate the molecular masses of

- (a) C_2H_2 ,
- (b) N_2H_4 ,
- (c) Na_2O ,
- (d) O_3 (ozone),
- (e) PH_3 ,
- (f) CO_2 ,
- (g) C_3H_9O

2. Calculate the density of each of the following substances, for which the mass of a specified volume is given:

- (a) 93.6 g occupying 15 mL
- (b) 0.992 g occupying 1,005 mL
- (c) 13.7 g occupying 11.4 mL
- (d) 16.8 g occupying 3.19 mL

3. Calculate the molar concentration of solute in each of the following solutions:

- (a) Exactly 7.59 g of NH_3 dissolved in 1.500 L of solution.
- (b) Exactly 0.291 g of H_2SO_4 dissolved in 8.65 L of solution.
- (c) Exactly 85.2 g of $NaOH$ dissolved in 5.00 L of solution.
- (d) Exactly 31.25 g of $NaCl$ dissolved in 2.00 L of solution.
- (e) Exactly 6.00 mg of atmospheric N_2 dissolved in water in a total solution volume of 2.00 L.

3. Using the appropriate gas laws, calculate the quantities denoted by the blanks in the table below:

Conditions before				Conditions after			
n_1 , mol	V_1 , L	P_1 , atm	T_1 , K	n_2 , mol	V_2 , L	P_2 , atm	T_2 , K
1.25	13.2	1.27	298	1.25	(a) _____	0.987	298
1.25	13.2	1.27	298	1.25	(b) _____	1.27	407
1.25	13.2	1.27	298	4.00	(c) _____	1.27	298
1.25	13.2	1.27	298	1.36	(d) _____	1.06	372
1.25	13.2	1.27	298	1.25	30.5	(e) _____	298

4. Calculate the amount of heat required to raise the temperature of 7.25 g of liquid water from 22.7°C to 29.2°C.

5. Calculate the heat (q)

(a) required to evaporate 5.20 g of liquid water

(b) released when 6.50 g of water vapor condenses.