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1) A 2.4L sample of an ideal gas at STP is compressed to a volume of 1.5L. Assuming that the temperature and amount of material is kept constant what is the pressure of the gas at the final volume?

$$P_2 = P_1 V_1$$
 $P_2 = \frac{(1atm)(2.4L)}{1.5L}$ $P_2 = 1.6 atm$ or $101.3 kPa$

P.V. = P2 V2 2) A 5.0 \pm 0.5 mL sample of gas has a measured pressure of 3.25 \pm 0.01 atm, and a R=0.08006 measured temperature of 20.0 ± 0.5 °C. How many mols of the gas are in the sample?

measured temperature of 20.0
$$\pm$$
 0.5 C. How many mois of the gas are in the sample?

PV=NRT $9.5 = 10^{\circ}/_{\circ}$ $9.5 = 2.5^{\circ}/_{\circ}$ $(3.25 \pm 0.3^{\circ}/_{\circ})(5.0 \pm 10^{\circ}/_{\circ}) = 16 \pm 10.3^{\circ}/_{\circ}$ $= 9.8 \pm 12.8^{\circ}/_{\circ}$ $= 9.8 \pm 1.3$ moly $= 9.8 \pm 1.3$ moly

$$\frac{6 \pm 10.3\%}{1.64 \pm 2.5\%} = 9.8 \pm 12.8$$

$$= 9.8 \pm 1.3 \text{ A}$$

3) Dimethylhydrazine is a carbon-hydrogen-nitrogen compound with important uses in rocket fuels. When burned completely in oxygen gas, a 0.312g sample yields 0.458 g CO₂ and 0.374 g of H₂O. From a separate 0.525 g sample, the nitrogen content was converted to 0.244 g N₂. What is the empirical formula of dimethylhydrazine?

$$\frac{96H \cdot 100}{-100} = 5.6\%$$

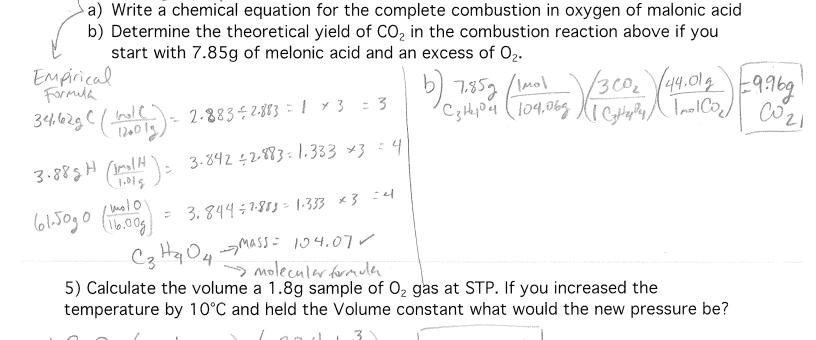
$$= \frac{1.01}{19.02} (100) = 5.6\%$$

$$\frac{96C \cdot 1000}{19.02} = \frac{12.01}{44.01} (100) = 27.3\%$$

- 3) 50mL of a 6.0M solution of HCl is mixed with 100mL of a 2.5M solution of NaOH. HCl + NaOH -> NaCl +HO
 - a) What is the final concentration of Na⁺ ion.
 - b) HCl and NaOH react to form water and NaCl, and any access in either would lead to either excess H⁺ or OH⁻ in solution please determine the concentration of the excess ion (H⁺ or OH⁻).
 - c) How many NaOH particles where involved in this reaction?

b)
$$0.05L(\frac{brol}{1L}) = 0.3mol HU 0.1L(\frac{2.5mol}{1L}) = 0.25mol$$

Empirical Formula of Dinethylhydratine is C, H2N



4) Malonic acid is an organic compound with a molecular mass of 104.06 g/mol, and a

composition of 34.62% C, 3.88% H, and 61.50% O, by mass.

C3H404 +202 -> 3CO2 +2H20

6) Calculate the atomic weight of the unknown element M, if the molar mass of the compound $\rm Na_2M_2O_3$ is 156 g/mol

$$2Na = 45.982$$
 $30 = 48.009$
 $M_2 = 62.02$
 $N_{0} = 93.982$
 $M_2 = 62.02$
 $M_3 = 62.02$
 $M_4 = 7000$
 $M_4 = 7000$