IB practice test topic1 Name

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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?

2) A 5.0 ± 0.5 mL sample of gas has a measured pressure of 3.25 ± 0.01 atm, and a measured temperature of 20.0 ± 0.5 °C. How many mols of the gas are in the sample?

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?

3) 50mL of a 6.0M solution of HCl is mixed with 100mL of a 2.5M solution of NaOH.

1. What is the final concentration of Na+ ion.
2. 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-).
3. How many NaOH particles where involved in this reaction?

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.

1. Write a chemical equation for the complete combustion in oxygen of malonic acid
2. Determine the theoretical yield of CO2 in the combustion reaction above if you start with 7.85g of melonic acid and an excess of O2.

5) Calculate the volume a 1.8g sample of O2 gas at STP. If you increased the temperature by 10°C and held the Volume constant what would the new pressure be?

6) Calculate the atomic weight of the unknown element M, if the molar mass of the compound Na2M2O3 is 156 g/mol