**C:\Documents and Settings\toukonen\Local Settings\Temporary Internet Files\Content.IE5\VQ3BI0MW\MCSY01847_0000[1].wmfC:\Documents and Settings\toukonen\Local Settings\Temporary Internet Files\Content.IE5\PUILT2DB\MCSY01846_0000[1].wmfFinal Exam Review**

**Worksheet 10**

1. A gas is collected over water and occupies a volume of 596 ml at 43°C. The atmospheric pressure is 101.1 kPa. What volume will the dry gas occupy at 43°C and standard atmospheric pressure? The vapor pressure of water at 43°C is 8.6 kPa (Ch. 11). **(0.54 L)**
2. Given the following data (Ch. 8):
   * + - 1. S (s) + 3/2 O2 (g) → SO3 (g) ΔH = -395.2 kJ
         2. 2 SO2 (g) + O2 (g) → 2 SO3 (g) ΔH = -198.2 kJ

Calculate ΔH for the following reaction: S (s) + O2 (g) → SO2 (g) **(-296.1 kJ)**

1. For each of the following molecules, indicate the molecular geometry, bond angle(s) and polarity (Ch. 10).

H2CO, BF3, S2Cl2, SF6

1. A sample of benzene, C6H6, weighing 3.51 grams was burned in a bomb calorimeter. The temperature rose from 23.63°C to 37.18°C. When one mole of benzene burns, 14.62 kJ are given off. What is the heat capacity of the calorimeter in J/°C ? (Ch. 12) **(48.55 J/0C)**
2. What is the frequency of a light wave with a wavelength of 7.5 × 105 nm? (Ch. 9) **(4.0E11 Hz)**
3. List the types of IMF found in each of the following (Ch. 12): NO, CO2, H2S, SO2
4. Using the molecules listed in #6, list from lowest to highest vapor pressure (Ch. 12).
5. Determine the boiling point of a solution consisting of 500 ml of water and 125 grams of MgCl2. (Ch. 12) **(104.030C)**
6. A container holds 265 ml of chlorine gas, Cl2. Assuming that the gas sample is at STP, what is its mass? (Ch. 11) **(0.84 g)**
7. Methanol, CH3OH, is made by causing carbon monoxide and hydrogen gases to react at high temperature and pressure. If 4.5 × 102 mL of CO and 825 mL of H2 are mixed (Ch. 11).
   1. Which reactant is present in excess?
   2. What volume of CH3OH is produced assuming the same pressure. **(412.5 ml)**
8. For each of the following pairs, which has the greatest electron affinity? (Ch. 9)
   * 1. Chlorine or iodine
     2. Sodium or rubidium
     3. Zirconium or molybdenum