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**Worksheet 9**

1. Rank the following elements from most stable to least stable according to their electron configuration: Xe, Rb, Zn, Pd (Ch. 9)
2. For each of the following molecular geometries, list the number of unshared pairs (Ch. 10):
   1. Tetrahedral/bent
   2. Octahedron/square planar
   3. TBP/linear
3. Calculate the molality of a solution containing 19 grams of KCl in 150 g of water (Ch. 13). **(1.7 m)**
4. Determine the mass of sodium chloride present in 50 ml of a 20% solution (Ch. 13). **(10 g)**
5. Explain how you determine the “normal” boiling point of a substance (Ch. 12).
6. When one mole of ethanol, C2H5OH, burns in a calorimeter 1360 kJ are given off. The heat capacity of the calorimeter is 9.63 kJ/°C. The burning of a particular sample causes the temperature to rise from 25.00°C to 33.73°C. What is the mass of this sample (Ch. 12)? **(2.84 g)**
7. A 500 ml sample of gas is collected over water at 1.5 atm and 30⁰C. What is the volume of the dry gas at STP? (Water vapor pressure at 30⁰C is 0.042 atm.) (Ch. 11). **(0.657L)**
8. Suppose that 6.50 × 102 ml of hydrogen gas are produced through a replacement reaction involving solid iron and sulfuric acid, H2SO4, at STP. How many grams of iron (II) sulfate are also produced (Ch. 11)? **(4.4 g)**
9. Calculate the energy of a photon that has a frequency of 3.3 × 1013 s-1 (Ch. 9). **(2.19E-20J)**
10. Identify the element that has the following electron configuration: 1*s*22*s*22*p*63*s*23*p*64*s*23*d*104*p*65*s*24*d*105*p*2. How many unpaired electrons are present (Ch. 9).
11. Rank the following accordingly from highest to lowest boiling point. HCl, Ar, CH4, HF (Ch. 12).
12. Using the same molecules as in #11, rank from lowest to highest viscosity (Ch. 12).