**1A Exam2 (Ch 3, 4, part 10) Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Relax!!! Read!!! And Remember….\*All calculations & answers must be shown fully and with units and chemical names to receive full credit.**

1. Using your Chemical Formula as a Conversion Factor: Calculate the mass (in kg) of oxygen atoms present in 2.4 x 10-3 moles of calcium nitrate.
2. Combustion Analysis to determine an Empirical Formula: A petroleum compound containing carbon and hydrogen, produced 38.196g of carbon dioxide and 18.752g of water upon combustion. Calculate the empirical formula of the compound.
3. Given the following reaction: 2Al(s) + 3Cl​2​​(g) → 2AlCl​3​​(s)
   1. Determine the limiting reactant AND calculate the theoretical yield of product in grams when 2.8 grams of Al reacts with 4.25 grams of Cl2. You must have a calculation for each reactant to prove which is the LR as done in class. Be sure to label the LR and the TY as well.
   2. Calculate the mass of excess reactant that was USED/REACTED?
   3. Calculate the mass of excess reactant that is LEFTOVER/WASTE/UNREACTED?
4. A person suffering from hyponatremia (low concentration of sodium in their blood) has a sodium ion concentration of 0.118M and a total blood volume of 4.6L. Calculate the mass (in kg) of sodium ions in their body.
5. 0.375 grams of an unknown gas at 832torr, 38°C, and 255mL has what molar mass? Recall, that PV = nRT, R = 0.08206 atm L /mol K, 1atm = 760mmHg, °C + 273 = K.
6. Single Replacement Reactions & Redox:
   1. Write the balanced single replacement reaction for when zinc metal reacts with hydrochloric acid. Label all phases.
   2. Assign oxidation states to each atom in the above reaction.
   3. Explain clearly which atom is the reducing agent.
7. Double Replacement Reactions: Write the balanced molecular equation AND NET ionic equation for the reaction between aqueous solutions of potassium carbonate and hydrobromic acid. Label all phases. Assume any potassium product to be soluble. You should know the rest of the other phases! (no total ionic reaction needs to be shown)