**Calculation Questions**

1. Calculate the relative molecular mass of:
   1. CaCO3
   2. C5H12
   3. Fe2O3
   4. CH3CH2OH
   5. (NH­4)2SO4
2. Determine the empirical formula of these compounds:
   1. An oxide of chromium contains 68.4% Cr and 31.6% O
   2. An unidentified compound containing 29.84 g sodium, 67.49 g chromium and 72.67 g oxygen
3. Determine the molecular formula of the compound:
   1. A compound containing 5.93% hydrogen and 94.07% oxygen, with a relative molecular mass of 34.0 g/mol
   2. A compound with a relative molecular mass of 162.1 g/mol, containing 74% carbon, 8.7% hydrogen, and 17.3% nitrogen.
   3. A hydrocarbon with the empirical formula CH, and relative molecular mass 78 g/mol
4. Calculate the concentration in g/dm3:
   1. 10 g of magnesium chloride dissolved in 150 cm3 of solution
   2. 2.3 g of lithium chloride in 500 cm3 of solution
5. Calculate the mass required to make the following solutions:
   1. 0.5 dm3 of a 2 g/dm3 solution of silver nitrate
   2. 10 cm3 of a 0.4 g/dm3 solution of sodium carbonate
   3. How many moles are in 15 g of lithium?
   4. How many grams are in 238 mol of arsenic?
   5. How many moles are in 1.2x103 grams of ammonia, NH3?
   6. How many grams are in 2.3x10-4 moles of calcium phosphate, Ca3(PO3)2?
6. Calculate the number of particles (atoms or compounds) in each of question 6.
7. What is the limiting reactant in the following equations?
   1. NaOH + HCl --> NaCl + H2O
      1. NaOH = 10 g
      2. HCl = 10 g
   2. Ca(OH)2 + 2HCl --> CaCl2 + 2H2O
      1. Ca(OH­)2 = 10 g
      2. HCl = 10 g
   3. CH4 + 2O2 --> CO2 + 2H2O
      1. CH4 = 4 mg
      2. O2 = 15 mg
8. For each of the reactions above, calculate the maximum mass of water which could be produced.