Chemistry

Name: _____

Section _____ PERCENT COMPOSITION Date: _____

Determine the percent composition by mass in each of the compounds below.

1. H_2O = 18.0153 u
   H = 2(1.00794 u) / 18.0153 u = 0.111898 or 11.1898%
   O = 15.9994 u / 18.0153 u = 0.888101 or 88.8101%

2. $Al(NO_3)_3$ = 212.9962 u
   Al = 26.98154 u / 212.9962 u = 0.1266762 or 12.66762%
   N = 3(14.0067 u) / 212.9962 u = 0.196281 or 19.6281%
   O = 9(15.9994 u) / 212.9962 u = 0.676043 or 67.6043%

3. $(NH_4)_2S$ = 68.142 u
   N = 2(14.0067 u) / 68.142 u = 0.41110 or 41.110%
   H = 8(1.00794 u) / 68.142 u = 0.11833 or 11.833%
   S = 32.065 u / 68.142 u = 0.47056 or 47.056%

4. Na_2CO_3 = 105.989 u
   Na = 2(22.98977 u) / 105.989 u = 0.43381 or 43.381%
   C = 12.011 u / 105.989 u = 0.11332 or 11.332%
   O = 3(15.9994 u) / 105.989 u = 0.452860 or 45.2860%

Determine the percent composition by mass of water in the following hydrates.

5. $MgSO_4 \cdot 7H_2O$ = 246.475 u
   = 7 (18.0153 u) / 246.475 u = 0.511642560097
   51.1643%

6. copper(II) chloride dihydrate $CuCl_2 \cdot 2H_2O$ = 170.483 u
   = 2 (18.0153 u) / 170.483 u = 0.2113442396
   21.1344%

Solve the following problems.

7. How many grams of oxygen can be produced from 75.0 g of $Mg(ClO_3)_2$? $Mg(ClO_3)_2 \rightarrow$ 191.21 u
   O = 6 (15.9994 u) / 191.21 u = 50.205%
   50.205% x 75.0 g = 37.653 g
   37.653 g

8. How much silver can be recovered from 500. g of AgCl? AgCl → 143.321 u
   Ag = 107.868 u / 143.321 u = 75.2632%
   75.2632% x 500. g = 376.316 g
   376.316 g

9. How much iron can be smelted from 250.0 kg of iron(II) sulfide? FeS → 87.910 u
   Fe = 55.845 u / 87.910 u = 63.525%
   63.525% x 250.0 kg = 158.81 kg
   158.81 kg