

ChemCom -- 2C.8 Worksheet

1. Calculate the molar mass of the following compounds.
a. chalk, b. milk of magnesia c. water flocculation agent

CaCO_3
 $\text{Ca} = 40.08$
 $\text{C} = 12.01$
 $3 \times \text{O} = 48.00$
 Mg(OH)_2
 $\text{Mg} = 24.31$
 $2 \times \text{O} = 32.00$
 $2 \times \text{H} = 2.00$
 $\text{Al}_2(\text{SO}_4)_3$
 $2 \times \text{Al} = 53.96$
 $3 \times \text{S} = 96.21$
 $12 \times \text{O} = 192.00$

2. How many moles are present in 500 grams of each of the substances in problem one?

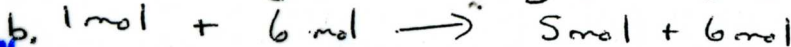
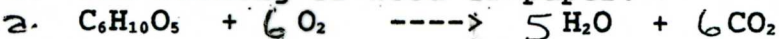
a. $500 \text{g CaCO}_3 \times \frac{1 \text{mol}}{100.09 \text{g}} = 5.00 \text{mol}$
 b. $500 \text{g Mg(OH)}_2 \times \frac{1 \text{mol}}{58.31 \text{g}} = 8.57 \text{mol}$
 $500 \text{g Al}_2(\text{SO}_4)_3 \times \frac{1 \text{mol}}{342 \text{g}} = 1.46 \text{mol}$

3. Calculate the number of grams in 15 moles of each substance in problem one.

a. $15 \text{ mol CaCO}_3 \times \frac{100.09 \text{g}}{1 \text{mol}} = 1501.4 \text{g} \approx 1500 \text{g}$
 b. $15 \text{ mol Mg(OH)}_2 \times \frac{58.31 \text{g}}{1 \text{mol}} = 874.7 \text{g} \approx 870 \text{g}$
 c. $15 \text{ mol Al}_2(\text{SO}_4)_3 \times \frac{342.17 \text{g}}{1 \text{mol}} = 5132.6 \text{g} \approx 5100 \text{g}$

For questions 4 & 5:

- a. Balance the chemical equation.
b. How many moles of each substance are shown in the balanced equation?
c. Calculate the mass of each substance shown in the equation.
4. The burning of wood or paper:

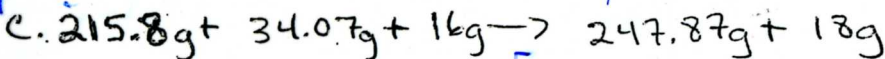
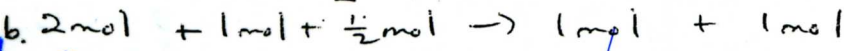


c. $162 \text{g} + 192 \text{g} = 90 \text{g} + 264 \text{g}$

Law of Cons. of Mass.

Total before = Total after
mass mass

5. Forming silver tarnish:



6. How many grams of oxygen are needed to burn 2 moles of wood according to the reaction in question 4?

~~$1 \text{ mol C}_6\text{H}_{10}\text{O}_5 + 6 \text{ mol O}_2$
 $\times 2$
 $2 \text{ mol C}_6\text{H}_{10}\text{O}_5 + 192 \text{g O}_2$
 $\text{Total} = 384 \text{g O}_2$~~

$2 \text{ mol C}_6\text{H}_{10}\text{O}_5 \times \frac{6 \text{ mol O}_2}{1 \text{ mol C}_6\text{H}_{10}\text{O}_5} \times \frac{32 \text{g}}{1 \text{ mol}} = 384 \text{g O}_2$
 molar ratio