CHM151 Q3b 25 Pts Fall 2005 Name: Key

Information: mole = 6.02×10^{23}, molar masses: S = 32.06, Al = 27.0
Ba = 137.3, C = 12.01, H = 1.01, N = 14.01, Si = 28.1, O = 16.00, P =31.0, Xe = 131.3, F = 19.0, K = 39.1
SHOW ALL WORK FOR CREDIT.

1. (4 Pts) a. Calculate the formula weight of $Ba(NO_3)_2$.

$6 \times 16.00 = 96.00$
$2 \times 14.01 = 28.02$
$1 \times 137.3 = 137.3$
261.32

b. Calculate the % O in $Ba(NO_3)_2$.

$\frac{96.00}{261.32} \times 100 =$ 36.737 % O

2. (4 Pts) What is the mass in grams of 0.832 moles of $Ba(NO_3)_2$?

$0.832 \text{ moles} \left| \frac{261.32 \text{ g}}{\text{mole}} \right. =$ 217.42 g

3. (4 Pts) How many sulfur atoms are there in 15.0 grams of sulfur?

$15.0 \text{ g S} \left| \frac{\text{mol}}{32.06 \text{ g}} \right| \frac{6.02 \times 10^{23} \text{ Atoms}}{\text{mol}} =$ 2.82×10^{23} S Atoms

4.(4 Pts) The first chemical compound containing a noble gas was prepared in 1962. What is the empirical formula for the compound that is 67.2% xenon and 32.8% oxygen by mass?

Assume 100 g:

Xe: $\frac{67.2 \text{ g}}{131.3 \text{ g}} \left| \frac{\text{mol}}{} \right. = 0.5118 \div 0.5118 = 1$

O: $\frac{32.8 \text{ g}}{16.00 \text{ g}} \left| \frac{\text{mol}}{} \right. = 2.05 \div 0.5118 = 4$

XeO_4

5. (5 Pts)How many moles of CO_2 will be produced from the complete combustion of 20.0 grams of C_8H_{18} ?

$2C_8H_{18} + 25O_2 \rightarrow 16CO_2 + 18H_2O$
20.0 g ? moles

$20.0 \text{ g } C_8H_{18} \left| \frac{\text{mole } C_8H_{18}}{114.26 \text{ g } C_8H_{18}} \right| \frac{16 \text{ mol } CO_2}{2 \text{ mol } C_8H_{18}} =$ 1.40 mol CO_2

6. (4 Pts) How many moles of H_2O would be produced from 36 moles of O_2 according to the following balanced equation?

$2C_8H_{18} + 25O_2 \rightarrow 16CO_2 + 18H_2O$
36 mol ? mol

$36 \text{ mol } O_2 \left| \frac{18 \text{ mol } H_2O}{25 \text{ mol } O_2} \right. =$ 25.92 mol H_2O