CHM 1045 CH 3 Homework

Show all calculations, units, and conversion factors. Use significant figures.

For the reaction $2H_2 + 1O_2 \rightarrow 2H_2O$, there are 8.08 grams of $H_2$ available.

1. Review Examples 3.05 and 3.06 in the chapter notes. Use molar mass (with two decimal places) to convert the grams of $H_2$ into moles. Then, use $N_A$ to convert the moles of $H_2$ into the number of molecules. Count the number of significant digits. Show all units and conversion factors. (2 pts)

2. Review Stoichiometry and Example 3.13 in the chapter notes. Use the ratio of stoichiometric coefficients in the reaction above to determine how many moles of $H_2O$ can be produced from the 8.08 g of $H_2$. Then, use molar mass to convert the moles of $H_2O$ into grams. Count the number of significant digits. Show all units and conversion factors. (2 pts)

3. Use the ratio of stoichiometric coefficients in the reaction above to determine how many moles of $O_2$ will react with the 8.08 g of $H_2$. Then, use molar mass to convert the moles of $O_2$ into grams. Count the number of significant digits. Show all units and conversion factors. (2 pts)

4. Review Limiting Reactant, Theoretical Yield, and Examples 3.15 in the chapter notes.
   Suppose there are 72.0 g of $O_2$ available, along with the 8.08 g of $H_2$.
   Use ratios of stoichiometric coefficients to find the limiting reagent for the reaction.
   Then, find the theoretical yield in both moles and grams.
   Count the number of significant digits. Show all units and conversion factors. (3 pts)

   $2H_2 + 1O_2 \rightarrow 2H_2O$

5. Review the Yields on the last page of the chapter 3 notes. Suppose 64.0 g of $H_2O$ are actually obtained from the mixture in problem 4. Calculate the Percent Yield both by using grams and by using moles. Count the number of significant digits. Show all units and conversion factors. How do the two values compare? (1 pt)