Mole Worksheet 2

Name Key

Answer the following questions.

1. Copper, Cu
   a. What is its atomic mass?
   63.546g
   b. How many moles are present in a sample of Cu that is 35.240 g?
   $35.240\text{g} \left| \frac{1\text{mol}}{63.546\text{g}} \right. = .55452\text{ mol}$
   c. How many atoms of copper are present in 35.240 g?
   $.55456\text{mol} \left| \frac{6.02\times10^{23}\text{atoms}}{1\text{mol}} \right. = 3.3395\times10^{23}\text{ atoms}$
   d. How many grams of Cu are in a sample that contains 1.4×10^{24} atoms Cu?
   $1.4\times10^{24}\text{atoms} \left| \frac{63.546\text{g}}{6.02\times10^{23}\text{atoms}} \right. = 150\text{g}$
   e. Analysis shows 3.25×10^{23} atoms of copper. How many moles of Cu is this?
   $3.25\times10^{23}\text{atoms} \left| \frac{1\text{mol}}{6.02\times10^{23}\text{atoms}} \right. = .540\text{ mol}$
2. Oxygen gas, O_2
   a. What is its molar mass?
   $2\times16 = 32.00\text{g/mol}$
   b. How many moles are present in a sample of O_2 that is 9.25 g?
   $9.25\text{g} \left| \frac{1\text{mol}}{32.00\text{g}} \right. = .289\text{ mol}$
   c. How many ~~molecules~~ of oxygen are present in 9.25 g?
   $.289\text{mol} \left| \frac{6.02\times10^{23}\text{molec}}{1\text{mol}} \right. = 1.74\times10^{23}\text{molec.}$
   d. How many grams of O_2 are in a sample that contains 1.4×10^{24} O_2 molecules?
   $1.4\times10^{24}\text{molec} \left| \frac{1\text{mol}}{6.02\times10^{23}\text{molec}} \right| \frac{32.00\text{g}}{1\text{mol}} = 74\text{g}$
   e. Analysis shows 3.25×10^{23} molecules of oxygen. How many moles of O_2 is this?
   $3.25\times10^{23}\text{molec} \left| \frac{1\text{mol}}{6.02\times10^{23}\text{molec}} \right. = .540\text{ mol}$
3. $CaCO_3$
   a. What is its molar mass?
   $40.08 + 12.01 + 3\times16 = 100.09\text{ g/mol}$
   b. How many moles are present in a sample of $CaCO_3$ that is 5.00 g?
   $5.00\text{g} \left| \frac{1\text{mol}}{100.09\text{g}} \right. = .0500\text{ mol}$
   c. How many grams of $CaCO_3$ are in a sample that contains 9.4×10^{22} molecules of $CaCO_3$?
   $9.4\times10^{22}\text{molec} \left| \frac{1\text{mol}}{6.02\times10^{23}\text{molec.}} \right| \frac{100.09\text{g}}{1\text{mol}} = 16\text{g}$