Review Exercise 7 - Quantity of Matter Calculations

Calculating Molar Masses

Calculate the mass of one mole of each of the following substances to two decimal places. Include the correct unit in each answer. The first four are done for you in case you've forgotten how to do them.

1. $Ag_{(s)}$ **107.87 g/mol** (Just look it up on the Periodic Table).
2. $CO_{2(g)}$ 12.01g/mol + 2(16.00 g/mol) = **44.01 g/mol** (Add up the molar masses of all the atoms in the molecule)
3. $SO_{2(g)}$ 32.06 g/mol + 2(16.00 g/mol) = **64.06 g/mol**
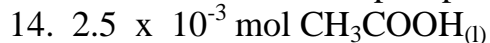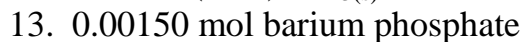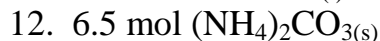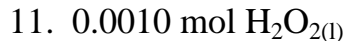4. $H_2SO_{4(l)}$ 2(1.01 g/mol) + 32.06 g/mol + 4(16.00 g/mol) = **98.08 g/mol**

Here are the rest of the questions:

Name of Compound	Molar mass	Name of Compound	Molar mass
2. $CO_{2(g)}$	.	9. $MgO_{(s)}$	.
3. $SO_{2(g)}$	.	10 $Hg_2O_{(s)}$	.
4. $H_2SO_{4(l)}$	.	11. Aluminum sulfate	.
5. Chlorine gas	.	12. $(NH_4)_2SO_{4(s)}$	.
6. Sodium hydrogen carbonate	.	13. $C_8H_{18(g)}$	.
7. $CaCO_{3(s)}$	.	14. Lithium hydrogen sulfate	.
8. Silver nitrate	.	15. $NaOH_{(s)}$	.

Converting a given number of moles to a mass in grams (Conversion 1)

Find the mass in grams of each of the following quantities of the substances below. Use dimensional analysis for each question in the space provided, and report the answer in the correct units to the correct number of significant digits. The first question is done for you.

1. 0.036 moles of $O_{2(g)}$ (0.036 mol $O_{2(g)}$ x $\dfrac{32.00 \text{ g } O_{2(g)}}{1 \text{ mol } O_{2(g)}}$ =   **1.2 g $O_{2(g)}$**)

2. 1.5 mol $AgNO_{3(s)}$
3. 2.1 x 10^{-3} mol $Na_2O_{(s)}$
4. 0.0792 mol $CO_{(g)}$
5. 2.6 mol $Zn_{(s)}$
6. 4.44 mol $HNO_{3(l)}$
7. 0.120 mol sodium hydroxide
8. 1.20 mol $K_2Cr_2O_{7(s)}$
9. 4.05 mol dinitrogen pentoxide
10. 0.0102 mol $Mg(NO_3)_{2(s)}$
11. 0.0010 mol $H_2O_{2(l)}$
12. 6.5 mol $(NH_4)_2CO_{3(s)}$
13. 0.00150 mol barium phosphate
14. 2.5 x 10^{-3} mol $CH_3COOH_{(l)}$
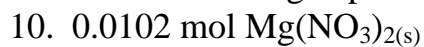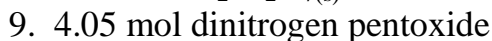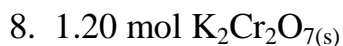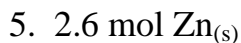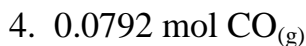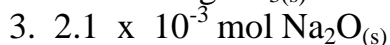
Converting a given mass in grams of a substance to moles (Conversion 2)

In the space provided, calculate the number of moles of each substance present in each of the following samples, to the correct number of significant digits. The first question is done for your. Use dimensional analysis.

1. 142 g $Cl_{2(g)}$ 142 g $Cl_{2(g)}$ x $\dfrac{1 \text{ mol } Cl_{2(g)}}{70.90 \text{ g } Cl_{2(g)}}$ = **2.00 mol $Cl_{2(g)}$**

2. 17.5 g $NaCl_{(s)}$
3. 76.5 g of water
4. 8.80 g of $CO_{2(g)}$
5. 150.0 g $MgCO_{3(s)}$
6. 1.25 g $CuSO_{4(s)}$
7. 9.81 g $H_2SO_{4(l)}$
8. 0.980 g $CO_{(g)}$
9. 68.8 g of lithium hydrogen carbonate
10 122.6 g of $Al_2(SO_4)_{3(s)}$
11. 1.36 kg of carbon tetrachloride
12. 40.0 g of $NaOH_{(s)}$
13. 225 g of $H_2S_{(g)}$
14. 0.00600 g $Al_2S_{3(s)}$