Name: _____ Period _____ Date _____

Worksheet

Using Molar Mass & Avogadro's Number

Part 1: Using Molar Mass

Recall that _____ mass is the mass of a compound, if one mole of the substance is present. But what if we don't have exactly one mole? Molar mass can be used as a _____ factor in this case to convert from mols to grams or grams to mols.

Write the molar mass of $KMnO_4$ (158.04) as a conversion factor:

Molar Masses Reference

$Ca(NO_3)_2$: 164.10 g/mol

$(NH_4)_3PO_4$: 149.12 g/mol

SO_2 : 64.07 g/mol

Ca: 40.08 g/mol

*Convert the following quantities to **grams** of the substance:*

1. 1.75 mol $KMnO_4$

2. 0.363 mol $Ca(NO_3)_2$

3. How many grams of $(NH_4)_3PO_4$ are in 5.54 mol?

*Convert the following quantities to **mols** of the substance:*

1. 100 g $KMnO_4$

2. 574 g $Ca(NO_3)_2$

3. How many mols of $(NH_4)_3PO_4$ are in 298 g?

Part 2: Avogadro's Number

It can also be helpful to know how many particles (atoms, formula units, or molecules) are in sample. In this case, Avogadro's number can be used as a conversion factor.

Write Avogadro's Number as a conversion factor:

1. How many **atoms** of Ca are in 51.0 g?

2. Calculate the number of **formula units** of $KMnO_4$ in 100. g:

3. Calculate the number of **molecules** of SO_2 in 87.2 g:

4. How many **<u>grams</u>** of $(NH_4)_3PO_4$ are in 9.60×10^{23} formula units?

Additional Practice Problems:

Determine the number of moles in the quantities below:

1. 25.0 g of NaCl
2. 125 g of H_2SO_4
3. 74.0 g of KCl
4. 35.0 g of $CuSO_4 \ 5H_2O$

Determine the number of grams in the quantities below:

5. 2.50 moles of NaCl
6. 0.500 moles of H_2SO_4
7. 0.250 moles of KCl
8. 3.2 moles of $CuSO_4 \ 5H_2O$
9. 8.54×10^{23} molecules of CH_4

Answers:

1) **0.468 mol** 2) **1.27 mol** 3) **.993 mol** 4) **0.140 mol** 5) **134 g** 6) **49.0 g** 7) **18.6 g** 8) **799 g** 9)**22.8 g**