

Honors Chemistry Worksheet 1

Mass-Moles-Particles

Molstoiws09.doc

Name _____ Date _____ Period _____

Concept Questions:

1. One mole is defined as _____

2. The mole only applies to chemistry, in other words you couldn't have a mole of cars or a mole of stars. (Circle one) True / False
3. The mole is a _____ unit, whereas grams is a _____ unit.
4. The coefficients in a balanced chemical equation can be used with which of the following for setting up ratios (Circle all that apply)
Moles Grams Molecules/Atoms
5. To convert from grams to moles of a substance you must _____
6. To convert from moles to grams of a substance you must _____
7. To convert from moles to molecules of a substance you must _____
8. To convert from molecules to atoms of a substance you must _____

9. The molar mass of a compound is found by _____
10. The mole has the numerical value of _____ and is known as _____.

Problem Solving: Perform the following calculations using the example below as a guide:

Example Problem: Convert 20.0g of HCl to moles of HCl

Answer: $20.0\text{gHCl} \frac{1\text{molHCl}}{36.46\text{g}} = .55\text{mol HCl}$

Molar mass
of HCl

Convert to moles:

1. 15.5g of H₂O $\left[\frac{\text{mol}}{\text{g}} \right] =$ 2. 125.0g of H₂SO₄ $\left[\frac{\text{mol}}{\text{g}} \right] =$

3. 16.10g of lithium nitrate

4. 100.0g of dinitrogen tetraoxide

Convert to grams:

1. $.0024 \text{ mol NH}_3 \left[\frac{\text{g}}{\text{mol}} \right] =$

2. $6.5 \times 10^{-4} \text{ mol CO} \left[\frac{\text{g}}{\text{mol}} \right] =$

3. 4.0mol carbon tetrachloride

4. 2.5mol nitrogen gas

Synthesis Questions:

1. How many grams of HCl contain the same number of units as there are in 60.0g of CaCl₂?

2. How many moles of HCl contain the same number of grams as there are in .45mol of CaCl₂?

3. How many times more particles are there in 10.0g of H₂O than in 10.0g of CO₂?

4. If you wanted a 2 to 1 ratio of H₂O molecules to CO₂ molecules and you had 50.0g of H₂O, how many grams of CO₂ would you need (Hint: It isn't 25!)?

5. Which element has a molar mass of 126.9g/mol?

6. For which element does 2.5 moles have a mass of 518g?

7. You performed an experiment on a diatomic element and found that .25g of the substance contained 6.58×10^{-3} moles. What is the element?