THE MOLE AND AVOGADRO'S NUMBER

Name _____

One mole of a substance contains Avogadro's Number (6.02×10^{23}) of molecules.

How many molecules are in the quantities below?

1. 2.0 moles
2. 1.5 moles
3. 0.75 mole
4. 15 moles
5. 0.35 mole

How many moles are in the number of molecules below?

1. 6.02×10^{23} atoms
2. 1.204×10^{24} moles
3. 1.5×10^{20} moles
4. 3.4×10^{26} atoms
5. 7.5×10^{19} atoms

GRAM FORMULA MASS / Molar mass

Name _____

Determine the gram formula mass (the mass of one mole) of each compound below.
* treat • like +

1. [redacted] potassium permanganate _____
2. [redacted] potassium chloride _____
3. [redacted] sodium sulfate _____
4. [redacted] calcium nitrate _____
5. [redacted] aluminum sulfate _____
6. [redacted] ammonium phosphate _____
7. $CuSO_4 \cdot 5H_2O$ _____
8. [redacted] magnesium phosphate _____
9. $Zn(C_2H_3O_2)_2 \cdot 2H_2O$ _____
10. $Zn_3(PO_4)_2 \cdot 4H_2O$ _____
11. [redacted] Hydrogen carbonate _____
12. $Hg_2Cr_2O_7$ _____
13. $Ba(ClO_3)_2$ _____
14. $Fe_2(SO_3)_3$ _____
15. $NH_4C_2H_3O_2$ _____

MOLES AND MASS

Name _____

Determine the number of moles in each of the quantities below.

1. 25 g of NaCl _____
2. 125 g of H_2SO_4 _____
3. 100. g of $KMnO_4$ _____
4. 74 g of KCl _____
5. 35 g of $CuSO_4 \cdot 5H_2O$ _____

Determine the number of grams in each of the quantities below.

1. 2.5 moles of NaCl _____
2. 0.50 moles of H_2SO_4 _____
3. 1.70 moles of $KMnO_4$ _____
4. 0.25 moles of KCl _____
5. 3.2 moles of $CuSO_4 \cdot 5H_2O$ _____

THE MOLE AND VOLUME

Name _____

For gases at STP (273 K and 1 atm pressure), one mole occupies a volume of 22.4 L. What volume will the following quantities of gases occupy at STP?

1. 1.00 mole of H_2

2. 3.20 moles of O_2

3. 0.750 mole of N_2

4. 1.75 moles of CO_2

5. 0.50 mole of NH_3

6. 5.0 g of H_2

7. 100. g of O_2

8. 28.0 g of N_2

9. 60. g of CO_2

10. 10. g of NH_3

MIXED MOLE PROBLEMS

Name _____

Solve the following problems.

1. How many grams are there in 1.5×10^{25} molecules of CO_2?

_____

2. What volume would the CO_2 in Problem 1 occupy at STP?

_____

3. A sample of NH_3 gas occupies 75.0 liters at STP. How many molecules is this?

_____

4. What is the mass of the sample of NH_3 in Problem 3?

_____

5. How many atoms are there in 1.3×10^{22} molecules of NO_2?

_____

6. A 5.0 g sample of O_2 is in a container at STP. What volume is the container?

_____

7. How many molecules of O_2 are in the container in Problem 6? How many atoms of oxygen?

_____

_____

MOLE CONVERSIONS