

Name: _____

Date: _____

Per#: _____

Atom Topic#4

Mole

WS#10: Trick or Treat

For the mole worksheets, you MUST show work on a separate sheet of paper with correct worksheet title.

Determine the molar mass of each compound in questions 1-6 include label.

1. $(\text{NH}_4)_3\text{PO}_4$
2. $\text{Al}_2(\text{SO}_4)_3$
3. $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
4. $\text{Mg}_3(\text{PO}_4)_2$
5. $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$
6. $\text{Ru}_3(\text{PO}_4)_2 \cdot 4\text{H}_2\text{O}$
7. How many moles are in 25 grams of NaCl?
8. Determine the mass of 2.5 moles of NaCl.
9. How many moles are in 125 grams of H_2SO_4 ?
10. Determine the mass of 0.50 moles of H_2SO_4 .

Mole Relationships*					
<u>Substance</u>	<u>Moles</u>	=	<u>Mass</u>	=	<u>Number of Particles</u>
C	1 mol C	=	12.01g	=	6.022×10^{23} atoms C
K^+	1 mol K^+	=	39.10g	=	6.022×10^{23} ions K^+
CO_2	1 mol CO_2	=	44.01g	=	6.022×10^{23} molecules CO_2
NaCl	1 mol NaCl	=	58.44g	=	6.022×10^{23} formula units NaCl
N_2	1 mol N_2	=	28.02g	=	6.022×10^{23} molecules N_2
N	1 mol N	=	14.01g	=	6.022×10^{23} atoms N
$\text{C}_{11}\text{H}_{22}\text{O}_{10}$	1 mol $\text{C}_{11}\text{H}_{22}\text{O}_{10}$	=	330.33g	=	6.022×10^{23} molecules $\text{C}_{11}\text{H}_{22}\text{O}_{10}$

*If one was to put an equal sign in between each relationship, one gets a line of equivalencies.

WS#11: Headless Horseman

Solve the following for the number of atoms (molecules), moles or grams.

1. A chemist has a jar containing 388.2 g of iron filings. How many moles of iron does the jar contain? (Ans: 6.951 mol Fe)
2. A student needs 0.366 mol of Zn for a reaction. What mass of Zn in grams should the students obtain? (Ans: 23.9 g Zn)
3. How many moles of Li are there in 1.204×10^{24} Li atoms? (Ans: 2.00 mol Li)
4. How many boron atoms are there in 2.00 g of B? (Ans: 1.11×10^{23} atoms B)
5. Calculate the mass of the following number of atoms:
 - a. 6.022×10^{24} atoms of tantalum (Ans: 1.810×10^3 g)
 - b. 3.01×10^{21} atoms of cobalt (Ans: 0.295 g)
6. Calculate the mass of each of the following quantities:
 - a. 8.25×10^{22} molecules of BrF_3 (Ans: 23.9 g)
 - b. 5.00×10^{21} formula units of $\text{Al}(\text{OH})_3$ (Ans: 0.63 g)
7. Calculate the number of molecules or formula units in each of the following masses:
 - a. 0.272 g of $\text{Ni}(\text{NO}_3)_2$ (Ans: 8.91×10^{20} f.u)
 - b. 260 mg of CH_2CHCN (Ans: 2.95×10^{21} molecules)
8. Calculate the number of ions in 3.00 mol K^+ . (Ans: 1.81×10^{24} ions)
9. Calculate the mass of 1.56×10^{26} ions of Ca^{2+} . (Ans: 1.01×10^4 g)
10. A scientist has 50.0 grams of penicillin-G, $\text{C}_{16}\text{H}_{18}\text{N}_2\text{O}_4\text{S}$. How many molecules of penicillin-G does the scientist have? (Ans: 9.00×10^{22} molecules)
11. 0.354 moles of iron (II) ferricyanide, $\text{Fe}_3(\text{Fe}(\text{CN})_6)_2$, are produced in a reaction. How many grams were produced? (Ans: 209 g)

