

The Mole Webquest

Molecular Weight: Use this tutorial website to learn about counting atoms and molecules.

<http://www.chymist.com/molecular%20weight.pdf>

Set up a table for each problem to calculate the molecular weight of the following:

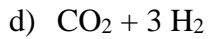
a) $K_2S_2O_4$

<u>Elements in the compound</u>	<u>Number of atoms for each element</u>	<u>Atomic Weight</u>
K		
S		
O		

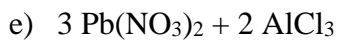
Formula Weight=_____

b) Ag_2CO_3

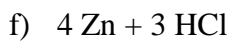
c) $Ca(C_2H_3O_2)_2$



- How many CO_2 molecules?
- How many H_2 molecules?
- How many C atoms total?
- How many O atoms total?
- How many H atoms total?



- How many $\text{Pb}(\text{NO}_3)_2$ molecules?
- How many AlCl_3 molecules?
- How many Pb atoms total?
- How many N atoms total?
- How many O atoms total?
- How many Al atoms total?
- How many Cl atoms total?



- How many Zn atoms?
- How many HCl molecules?
- How many Zn total?
- How many H total?
- How many Cl total?

The Mole:

Turn the Volume on and up on your computer!!

Watch this video as an introduction: <http://www.youtube.com/watch?v=ktlZZvmG8j0&feature=fvw>

View this website to answer the questions: <http://antoine.frostburg.edu/chem/senese/101/moles/faq/why-use-moles.shtml>

- 1) A mole of anything is how many of that thing? (give the number):
- 2) Why is it that different amounts of things can still equal one mole? (think about the weight of a dozen elephants vs a dozen eggs)
- 3) Why do we want to use the concept of moles?
- 4) Once we know the number of moles we can convert to the number of:
_____ or _____ and vice versa.
- 5) How many grams of water are in one mole of water?
- 6) How many molecules of water are in one mole of water?

Avogadro's Number:

Turn the Volume on and up on your computer!!

Watch this video as an introduction: <http://www.youtube.com/watch?v=gGRQaEsQb1I&feature=related>

View this website to answer the questions: <http://moleproject7.weebly.com/avogadro.html>

- 1) What is Avogadro's full name?
- 2) Originally, what profession was Avogadro?
- 3) In 1811 Avogadro wrote a paper that clearly distinguished a _____ from a _____.
- 4) What is Avogadro's Principle?
- 5) List one crazy fact about Avogadro's number.

Mole Problems:

Use the following website to answer the next set of questions:

<http://chemistry.about.com/od/workedchemistryproblems/a/molegramconvert.htm>

- 7) What is the atomic weight of one mole of CO_2 ?

- 8) Determine the number of moles of CO_2 in 454 grams.

Complete these problems based on what you have just learned!

Problem #1

- a. What is the atomic weight of one mole of CH_4 ?

- b. Determine the number of moles of 64 grams in CH_4 .

Problem #2: Determine the mass in grams of 3.6 moles of H_2SO_4 .

Problem #3: Determine the mass in grams of 4.2 moles of FeO_2 ?

Avogadro's Number Problems:

Use the following website to answer the next set of questions:

<https://chemfiesta.org/2015/03/23/equations-and-stoichiometry/>

Scroll down to "solving a 2 part chemistry problem"

- 1) What are the steps needed to convert 22 grams of copper to atoms of copper. Write the steps out (include T charts)

Problem #1: How many atoms are there in 34 grams of Lithium? Show all your work using a T-Chart.

Problem #2: How many atoms are there in 40 grams of NaHCO_3 ? Show all your work using a T-Chart.

Additional Practice Problems:

Molecular Weight Problems:

1. HCl

2. SiH_4

3. $\text{C}_3\text{H}_6\text{O}_2$

4. $\text{Fe}(\text{NO}_3)_3$

5. NaCl

6. CaSO_4

7. $\text{C}_2\text{H}_4\text{O}_2$

8. $\text{Sn}(\text{CO}_3)_2$

Mole Practice Problems:

1. What is the weight of 0.30 mole of sulfur?

2. What is the weight of 5.5 mole of silicon?

3. How many moles are there in 45 g of Cl ?

4. Change 34 g of lithium to moles.

5. What is the weight of 4.30 mole of sodium?
6. What is the weight of 1.75 mole of Ca?
7. How many moles are there in 85.3 g of P?
8. Change 0.566 g of silver to moles.

Gram-mole Practice Problems:

1. Change 3.4 moles of HCl to grams.
2. Change 8.5 g of SiH₄ to moles.
3. Change 5.20 moles of C₃H₆O₂ to grams.
4. Change 13.2 g of Fe(NO₃)₃ to moles.
5. Change 3.4 moles of NaCl to grams.
6. Change 8.5 g of CaSO₄ to moles.
7. Change 5.20 moles of C₂H₄O₂ to grams.
8. Change 13.2 g of Sn(CO₃)₂ to moles.

Avogadro's Number Problems:

1. How many atoms are there in 250 grams of tin?
2. How many atoms are there in 5.0 grams of gold?
3. How many molecules are there in 39 grams of water?
4. How many atoms are there in 125 grams of sugar molecules (C₁₂H₂₂O₁₁)?