

Molar Mass Worksheet

Calculate the molar masses of the following chemicals:

- 1) Cl_2
- 2) KOH
- 3) BeCl_2
- 4) FeCl_3
- 5) BF_3
- 6) CCl_2F_2
- 7) $\text{Mg}(\text{OH})_2$
- 8) UF_6
- 9) SO_2
- 10) H_3PO_4
- 11) $(\text{NH}_4)_2\text{SO}_4$
- 12) CH_3COOH
- 13) $\text{Pb}(\text{NO}_3)_2$
- 14) $\text{Ga}_2(\text{SO}_3)_3$

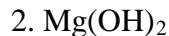
Worksheet – Mole Conversions

Name:

Show all work, including conversion factors and units. Watch sig figs.

I. Practice Problems

A. What is the mass of 1 mole (molar mass) of:



B. Convert from grams to moles, or moles to grams

1. How many moles is 12.5 g of magnesium hydroxide?

2. How many moles is 1.46 g of hydrogen gas (H_2)?

3. How many grams are in 4.3 moles of ammonium chloride?

C. Convert from moles to molecules, or molecules to moles

1. How many molecules are in 2.0 moles of hydrogen gas (H_2)?

2. How many moles is 2.0×10^{25} molecules of silver nitrate?

D. How many atoms of oxygen are in 2.4×10^{23} molecules of copper(II) sulfate?

II. Application Problems

A. How many molecules are in 96 g of carbon dioxide?

B. How many oxygen atoms are in 96 g of CO_2 ?

C. How many grams would 1.0×10^{25} molecules of copper(II) sulfate weigh?

D. How much does each individual molecule of copper(II) sulfate weigh?

Mole Worksheet (Dimensional Analysis) #2

I. What is the mass (in grams) for each of the following elements?

1. 7.24 moles of silver

2. 2.88 moles of phosphorous

3. 0.0009273 moles of zinc

4. 154.8 moles of silicon

5. 88.624 moles of iodine

II. Answer the following questions.

1. How many atoms are in 6.28 moles of aluminum?

2. How many atoms are in 90.43 moles of copper?

3. How many atoms in 7.64 moles of barium?

4. How many atoms in 3.72 moles of sulfur?

5. 78.54 g of nitrogen contains how many atoms?

6. How many moles of oxygen are represented by 8.33×10^{18} atoms of oxygen?

7. 76.4 g of lead contains how many atoms?

8. 76.4 moles of oxygen contains how many atoms?

9. How many grams does 8.92×10^{24} atoms of tin weigh?

10. What is the weight in grams of 4.28×10^{20} atoms of bromine?

Moles, Molecules, and Grams Worksheet

- 1) How many molecules are there in 24 grams of FeF_3 ?
- 2) How many molecules are there in 450 grams of Na_2SO_4 ?
- 3) How many grams are there in 2.3×10^{24} atoms of silver?
- 4) How many grams are there in 7.4×10^{23} molecules of AgNO_3 ?
- 5) How many grams are there in 7.5×10^{23} molecules of H_2SO_4 ?
- 6) How many molecules are there in 122 grams of $\text{Cu}(\text{NO}_3)_2$?
- 7) How many grams are there in 9.4×10^{25} molecules of H_2 ?
- 8) How many molecules are there in 230 grams of CoCl_2 ?

- 9) How many molecules are there in 2.3 grams of NH_4SO_2 ?
- 10) How many grams are there in 3.3×10^{23} molecules of N_2I_6 ?
- 11) How many molecules are there in 200 grams of CCl_4 ?
- 12) How many grams are there in 1×10^{24} molecules of BCl_3 ?
- 13) How many grams are there in 4.5×10^{22} molecules of $\text{Ba}(\text{NO}_2)_2$?
- 14) How many molecules are there in 9.34 grams of LiCl ?
- 15) How many grams do 4.3×10^{21} molecules of UF_6 weigh?
- 16) How many molecules are there in 230 grams of NH_4OH ?

Mole Calculation Worksheet

- 1) How many moles are in 15 grams of lithium?
- 2) How many grams are in 2.4 moles of sulfur?
- 3) How many moles are in 22 grams of argon?
- 4) How many grams are in 88.1 moles of magnesium?
- 5) How many moles are in 2.3 grams of phosphorus?
- 6) How many grams are in 11.9 moles of chromium?
- 7) How many moles are in 9.8 grams of calcium?
- 8) How many grams are in 238 moles of arsenic?

What are the molecular weights of the following compounds?

- | | |
|--------------------------|----------------------------------|
| 9) NaOH | 12) H_3PO_4 |
| 10) H_2O | 13) Mn_2Se_7 |
| 11) MgCl_2 | 14) $(\text{NH}_4)_2\text{SO}_4$ |

- 15) How many grams are in 4.5 moles of sodium fluoride, NaF?
- 16) How many moles are in 98.3 grams of aluminum hydroxide, Al(OH)₃?
- 17) How many grams are in 0.02 moles of beryllium iodide, BeI₂?
- 18) How many moles are in 68 grams of copper (II) hydroxide, Cu(OH)₂?
- 19) How many grams are in 3.3 moles of potassium sulfide, K₂S?
- 20) How many moles are in 1.2×10^3 grams of ammonia, NH₃?
- 21) How many grams are in 2.3×10^{-4} moles of calcium phosphate, Ca₃(PO₃)₂?
- 22) How many moles are in 3.4×10^{-7} grams of silicon dioxide, SiO₂?
- 23) How many grams are in 1.11 moles of manganese sulfate, Mn₃(SO₄)₇?

Grams/Moles Calculations

Given the following, find the number of moles:

- 1) 30 grams of H_3PO_4
- 2) 25 grams of HF
- 3) 110 grams of NaHCO_3
- 4) 1.1 grams of FeCl_3
- 5) 987 grams of Ca(OH)_2
- 6) 564 grams of copper
- 7) 12.3 grams of CO_2
- 8) 89 grams of $\text{Pb(CH}_3\text{COO)}_4$

Given the following, find the number of grams:

9) 4 moles of $\text{Cu}(\text{CN})_2$

10) 5.6 moles of C_6H_6

11) 21.3 moles of BaCO_3

12) 1.2 moles of $(\text{NH}_4)_3\text{PO}_3$

13) 9.3×10^{-3} moles of SmO

14) 6.6 moles of ZnO

15) 5.4 moles of K_2SO_4

16) 88.4 moles of NI_3

AMU Worksheet -

1. How many amu in 4.2 g of sulfur?
2. How many grams in 1.20×10^{35} amu of carbon?
3. How many atoms in 3.91 amu of sodium?
4. How many atoms in 45.22 amu of strontium?
5. How many molecules in 3.90×10^{15} amu of chlorine (Cl_2) gas?
6. How many nitrogen atoms in 140 amu of nitrogen?
7. What mass would 4.52×10^{24} molecules of water have in AMU?
8. How many amu in 2.3×10^{-8} g of oxygen?
9. What is the mass of 1.2×10^{-3} moles of sodium chloride in amu?
10. How many amu of NaCl are there in 3.55×10^{-6} g of salt?

1. How many moles of C is in 2.4 moles of C_6H_6 ?
2. How many F atoms are in 1 mole of F_2 ?
3. How many F atoms are in 1 mole of CF_4 ?
4. How many moles of Ge would you have if you have 2.4×10^{14} atoms of Ge?
5. If you have 4.5×10^{20} molecules of SnO_2 , how many moles of O do you have?
6. How many moles of H are in 2.5×10^{23} molecules of $\text{C}_2\text{H}_6\text{O}$?
7. How many atoms of C is in 2.5×10^{23} molecules of $\text{C}_2\text{H}_6\text{O}$?
8. What is the mass in grams of 1.0 mol of C?
9. What is the mass in amu of 1.0 mol of Cu?
10. What is the mass in grams of 3.0 mol of Cu?
11. How many moles are in 12.01 g of Fe?
12. How many atoms are in 63.54 g of Zn?
13. What is the mass, in g, of 6.022×10^{24} atoms of S?
14. How many moles of Mo is in 96 g of Mo?
15. How many moles of S is in 96 g of S?
16. What is the mass of 96 mol of Mo?
17. How many moles of MgCO_3 are in 100 g of MgCO_3 ?
18. How many grams of $\text{Cu}(\text{OH})_2$ are in 4.6 mol $\text{Cu}(\text{OH})_2$?
19. How many atoms of Cu are in 4.6 mol $\text{Cu}(\text{OH})_2$?
20. How many Cu atoms are in 25.7 g of $\text{Cu}(\text{OH})_2$?