# Worksheet: Mole Calculations & Percent Composition

A. Mole Calculations. You will need a periodic table to look up molecular weights. Do each type of calculation until you feel that you could do it without looking at notes. If you are very comfortable with a problem, skip down to harder ones. The answers will be on the web.

1. _____How many moles of Na are in 42 g of Na?

2. _____How many moles of O are in 8.25 g of O?

3. _____How much does 2.18 mol of Cu weigh?

4. _____What is the mass of 0.28 mol of iron?

5. _____How many atoms are in 7.2 mol of chlorine?

6. _____How many atoms are in 36 g of bromine?

7. _____How many moles are in $1.0 \times 10^9$ atoms?

8. _____What is the mass of $1.20 \times 10^{25}$ atoms of sulfur?

9. _____How many moles of CO molecules are in 52 g of CO?

10. _____How many moles of $C_2H_6$ are in 124 g?

11. _____How many moles of $CCl_4$ are there in 56 g?

12. _____How much does 2.50 mol of $H_2SO_4$ weigh?

13. _____How much does 0.25 mol of $Fe_2O_3$ weigh?

14. _____How many molecules are there in 52 g of CO?

15. _____How many *formula units* are in 22.4 g $SnO_2$?

16. _____How many molecules are in 116 g $CCl_4$?

17. _____What is the mass of $3.01 \times 10^{23}$ formula units of $Fe_2O_3$?

18. _____What is the mass of $1.2 \times 10^{25}$ molecules of CO?

19. _____How many O atoms are in 1.25 mol of $SO_2$?

20. _____How many moles of O atoms do you have when you have $1.20 \times 10^{25}$ $N_2O_5$ molecules?

21. _____How many formula units are in 5.33 mol of $CuCl_2$?

22. _____How many copper atoms are in 5.33 mol of $CuCl_2$?

23. _____How many moles of Cl atoms are in 5.33 mol of $CuCl_2$?

Calculate the percent composition of the compounds that are formed from these reactions:
1.  9.03 g of Magnesium combine completely with 3.48 g of Nitrogen.

2.  29.0 g of Argon combine completely with 4.30 g of Sulfur.

3.  222.6 g of Sodium combine completely with 77.4 g of Oxygen.

Calculate the percent composition of each of the following compounds:
4.  $C_2H_6$

5.  $NaHSO_4$

6.  $Ca(C_2H_3O_2)_2$

7.  HCN

8.  $H_2O$

Calculate the mass of the element in the given mass of compound:
9.  Mass of Hydrogen in 350 g $C_2H_6$

10. Mass of Oxygen in 20.2 g of $NaHSO_4$

11. Mass of Hydrogen in 124 g of $Ca(C_2H_3O_2)_2$

12. Mass of Nitrogen in 378 g HCN

**Answers**

1.  1.8 mol Na
2.  0.516 mol O
3.  139 g Cu
4.  16 g Fe
5.  $4.3 \times 10^{24}$ Cl atoms
6.  $2.7 \times 10^{23}$ Br atoms
7.  $1.7 \times 10^{-15}$ mol
8.  639 g S
9.  1.9 mol
10. 4.12 mol
11. 0.36 mol
12. 245 g
13. 39.9 g
14. $1.1 \times 10^{24}$ molecules
15. $8.95 \times 10^{22}$ formula units
16. $4.54 \times 10^{23}$ molecules
17. 79.9 g $Fe_2O_3$
18. $5.6 \times 10^2$ g CO
19. $1.51 \times 10^{24}$ O atoms
20. 99.7 mol O
21. $3.21 \times 10^{24}$ formula units
22. $3.21 \times 10^{24}$ Cu atoms
23. 10.7 mol of Cl atoms
24. 0.10 mol $CuCl_2$
25. $3.79 \times 10^{24}$ O atoms
26. $6.79 \times 10^{23}$ H atoms

# The Percent Composition Worksheet

**Calculate the percent composition of the compounds that are formed from these reactions:**

1. 9.03 g of Magnesium combine completely with 3.48 g of Nitrogen.

| | |
|---|---|
| 72.2% Mg | 27.8% N |

2. 29.0 g of Argon combine completely with 4.30 g of Sulfur.

| | |
|---|---|
| 87.1% Ar | 12.9% S |

3. 222.6 g of Sodium combine completely with 77.4 g of Oxygen.

| | |
|---|---|
| 74.2% Na | 25.8% O |

**Calculate the percent composition of each of the following compounds:**

4. $C_2H_6$

| | |
|---|---|
| 80.0% C | 20.0% H |

5. $NaHSO_4$

| | | | |
|---|---|---|---|
| 19.0% Na | 0.83% H | 26.5% S | 52.8% O |

6. $Ca(C_2H_3O_2)_2$

| | | | |
|---|---|---|---|
| 25.4% Ca | 30.4% C | 3.8% H | 40.5% O |

7. $HCN$

| | | |
|---|---|---|
| 3.7% H | 44.4% C | 51.9% N |

8. $H_2O$

| | |
|---|---|
| 11.1% H | 88.9% O |

**Calculate the mass of the element in the given mass of compound:**

9. Mass of Hydrogen in 350 g $C_2H_6$

| |
|---|
| 70. g H |

10. Mass of Oxygen in 20.2 g of $NaHSO_4$

| |
|---|
| 10.7 g O |

11. Mass of Hydrogen in 124 g of $Ca(C_2H_3O_2)_2$

| |
|---|
| 4.71 g H |

12. Mass of Nitrogen in 378 g HCN

| |
|---|
| 196 g N |

13. Mass of Oxygen in 100 g $H_2O$

| |
|---|
| 89 g O |