

Answer Key for Practice worksheet. I recommend you print this, cover the answers, and work each problem in succession, and check each answer.

Practice worksheet

Assume atomic weights as follows:

H	Hydrogen	1 g/mol
C	Carbon	12 g/mol
N	Nitrogen	14 g/mol
O	Oxygen	16 g/mol
F	Fluorine	19 g/mol
Na	Sodium	23 g/mol
Mg	Magnesium	24 g/mol
Al	Aluminum	27 g/mol

Si	Silicon	28 g/mol
P	Phosphorus	31 g/mol
S	Sulfur	32 g/mol
Cl	Chlorine	35 g/mol
K	Potassium	39 g/mol
Ca	Calcium	40 g/mol
Fe	Iron	56 g/mol
Zn	Zinc	65 g/mol

Balance the following chemical formulas

- $3\text{Fe} + 2\text{O}_2 \rightarrow \text{Fe}_3\text{O}_4$
- $\text{Cl}_2\text{O}_7 + \text{H}_2\text{O} \rightarrow 2\text{HClO}_4$
- $\text{C}_5\text{H}_{12} + 8\text{O}_2 \rightarrow 5\text{CO}_2 + 6\text{H}_2\text{O}$
- $2\text{C}_4\text{H}_{10} + 13\text{O}_2 \rightarrow 8\text{CO}_2 + 10\text{H}_2\text{O}$
- $\text{Al}_4\text{C}_3 + 12\text{H}_2\text{O} \rightarrow 4\text{Al}(\text{OH})_3 + 3\text{CH}_4$
- $\text{Al}_2(\text{SO}_4)_3 + 6\text{NaOH} \rightarrow 2\text{Al}(\text{OH})_3 + 3\text{Na}_2\text{SO}_4$

Calculate the formula mass of these compounds

- $\text{CH}_4 = 1(12 \text{ u}) + 4(1 \text{ u}) = 16 \text{ u}$
- $\text{AlF}_3 = 1(27 \text{ u}) + 3(19 \text{ u}) = 84 \text{ u}$
- $\text{C}_2\text{H}_5\text{NO}_2 = 2(12 \text{ u}) + 5(1 \text{ u}) + (14 \text{ u}) + 2(16 \text{ u}) = 75 \text{ u}$
- $\text{MgS}_2\text{O}_3 = 24 \text{ u} + 2(32 \text{ u}) + 3(16 \text{ u}) = 136 \text{ u}$
- $(\text{NH}_4)_3\text{PO}_4 = 3[14 \text{ u} + 4(1 \text{ u})] + (31 \text{ u}) + 4(16 \text{ u}) = 149 \text{ u}$
- $\text{Fe}(\text{NO}_3)_3 = 56 \text{ u} + 3[14 \text{ u} + 3(16 \text{ u})] = 242 \text{ u}$

Determine the number of moles of this mass of these compounds

- 64 g of CH_4 4 moles
- 22 g of CO_2 0.5 moles
- 150 g of $\text{C}_2\text{H}_5\text{NO}_2$ 2 moles
- 340 g of MgS_2O_3 = 2.5 moles
- 240 g of FeS_2 2 moles
- 500 g of ZnCO_3 4 moles

What is the mass (in grams) of these molar quantities of the compounds listed?

- 0.5 moles MgO_2 $24 + 2(16) = 56$ grams/mole 28 grams
- 1.25 moles CaH_2 $40 + 2(1) = 42$ grams/mole 52.5 g
- 0.25 moles $\text{C}_6\text{H}_{12}\text{O}_6$ $6(12) + 12(1) + 6(16) = 180$ g/mol 45 g
- 1.5 moles Fe_2O_3 $2(56) + 3(16) = 160$ g/mol 240 g
- 2 moles of SiO_2 $28 + 2(16) = 60$ g/mol 120 g
- 1 mole of AlF_3 $27 + 3(19) = 84$ g/mol 84 g

Calculate grams of the product starting with the specified grams of reactant.

- | | Balanced equation | grams of reactant | product to calculate |
|-----|--|-----------------------|-------------------------------|
| 25. | $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$ | 48 g O_2 | 160 g Fe_2O_3 |
| 26. | $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$ | 16 g CH_4 | 36 g H_2O |
| 27. | $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$ | 160 g O_2 | 72 g H_2O |
| 28. | $\text{Na}_2\text{SO}_4 + \text{ZnCl}_2 \rightarrow 2\text{NaCl} + \text{ZnSO}_4$ | 270 g ZnCl_2 | 232 g NaCl |
| 29. | $\text{AlCl}_3 + \text{Na}_3\text{PO}_4 \rightarrow \text{AlPO}_4 + 3\text{NaCl}$ | 44 g AlCl_3 | 58 g NaCl |
| 30. | $\text{ZnCO}_3 + 2\text{HCl} \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{ZnCl}_2$ | 72 g HCl | 44 g CO_2 |