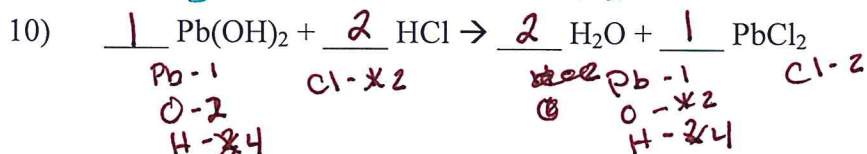
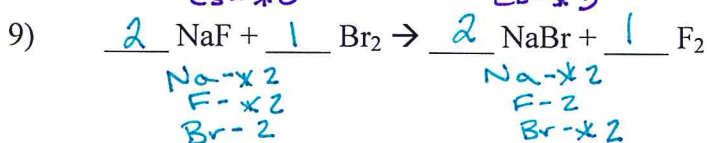
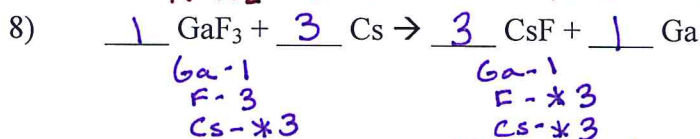
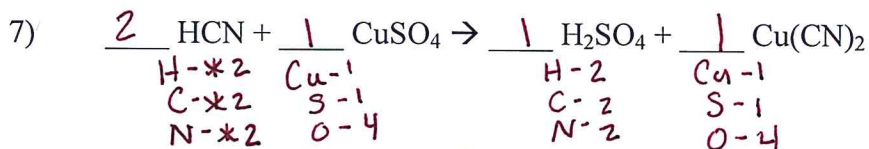
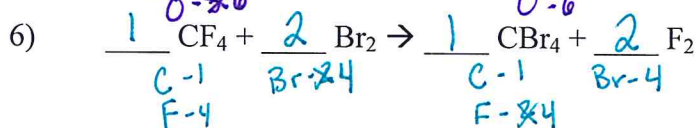
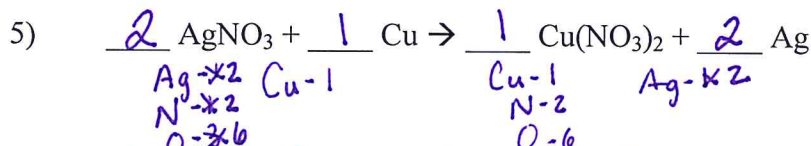
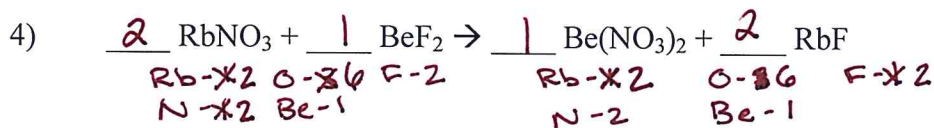
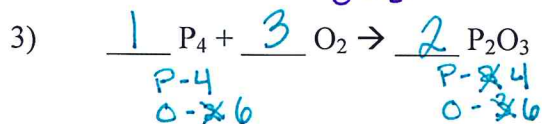
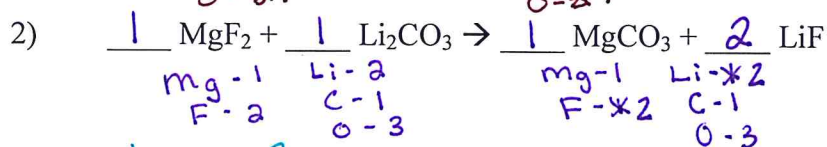
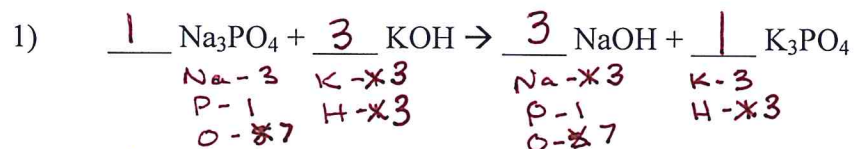
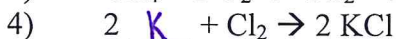
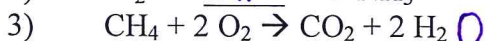
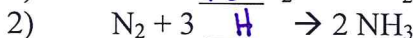
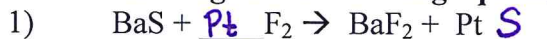


Physical Science – Unit 9B Extra Test Prep Practice
(Focused on Balancing and Moles)

Balance the following equations using coefficients:



What is missing in the following equations? Fill in the blanks.



grams — moles — molecules

Solve the following.

1. How many moles are in 72.9 g of HCl?

$$\frac{72.9 \text{ g}}{36.46 \text{ g/mol}} = 1.99 \text{ mol}$$

molar mass:

$$\begin{aligned} \text{H} &- 1 \times 1.01 = 1.01 \\ \text{Cl} &- 1 \times 35.45 = 35.45 \\ \hline &36.46 \end{aligned}$$

2. How many moles are in 79.85 g of Fe₂O₃?

$$\frac{79.85 \text{ g}}{159.67 \text{ g/mol}} = 0.5 \text{ mol}$$

molar mass:

$$\begin{aligned} \text{Fe} &- 2 \times 55.85 = 111.7 \\ \text{O} &- 3 \times 15.99 = 47.97 \\ \hline &159.67 \end{aligned}$$

3. How many molecules are in 720 g of C₆H₁₂O₆?

$$\frac{720 \text{ g}}{180.12 \text{ g/mol}} = 4 \text{ mol} \quad \frac{4 \text{ mol}}{1 \text{ mol}} \times 6.022 \times 10^{23} \text{ molecules} = 2.41 \times 10^{24} \text{ molecules}$$

2.41×10^{24} molecules

molar mass:

$$\begin{aligned} \text{C} &- 6 \times 12.01 = 72.06 \\ \text{H} &- 12 \times 1.01 = 12.12 \\ \text{O} &- 6 \times 15.99 = 95.94 \\ \hline &180.12 \end{aligned}$$

4. How many grams are in 3.5 mol of Ca₃(PO₄)₂?

$$\frac{3.5 \text{ mol}}{1 \text{ mol}} \times 310.1 \text{ g/mol} = 1,085.35 \text{ g}$$

molar mass:

$$\begin{aligned} \text{Ca} &- 3 \times 40.08 = 120.24 \\ \text{P} &- 2 \times 30.97 = 61.94 \\ \text{O} &- 8 \times 15.99 = 127.92 \\ \hline &310.1 \end{aligned}$$

5. How many molecules are in 8550g of SO₂?

$$\frac{8550 \text{ g}}{64.04 \text{ g/mol}} = 133.5 \text{ mol} \quad \frac{133.5 \text{ mol}}{1 \text{ mol}} \times 6.022 \times 10^{23} \text{ molecules} = 8.04 \times 10^{25} \text{ molecules}$$

molar mass:

$$\begin{aligned} \text{S} &- 1 \times 32.06 = 32.06 \\ \text{O} &- 2 \times 15.99 = 31.98 \\ \hline &64.04 \end{aligned}$$

6. How many grams are in 3.01 × 10²⁴ molecules of (NH₄)₂SO₄?

$$\frac{3.01 \times 10^{24} \text{ molecules}}{6.022 \times 10^{23} \text{ molecules/mol}} = 5 \text{ mol} \quad \frac{5 \text{ mol}}{1 \text{ mol}} \times 132.1 \text{ g/mol} = 660.28 \text{ g}$$

molar mass:

$$\begin{aligned} \text{N} &- 2 \times 14 = 28 \\ \text{H} &- 8 \times 1.01 = 8.08 \\ \text{S} &- 1 \times 32.06 = 32.06 \\ \text{O} &- 4 \times 15.99 = 63.96 \\ \hline &132.1 \end{aligned}$$

7. How many molecules are in 85 g of AgNO₃?

$$\frac{85 \text{ g}}{169.87 \text{ g/mol}} = 0.5 \text{ mol} \quad \frac{0.5 \text{ mol}}{1 \text{ mol}} \times 6.022 \times 10^{23} \text{ molecules} = 3.01 \times 10^{23} \text{ molecules}$$

molar mass:

$$\begin{aligned} \text{Ag} &- 1 \times 107.86 = 107.86 \\ \text{N} &- 1 \times 14.00 = 14.00 \\ \text{O} &- 3 \times 15.99 = 47.97 \\ \hline &169.83 \end{aligned}$$

8. How many grams are in 1.204 × 10²⁴ molecules of CH₃COOH?

$$\frac{1.204 \times 10^{24} \text{ molecules}}{6.022 \times 10^{23} \text{ molecules/mol}} = 2 \text{ mol} \quad \frac{2 \text{ mol}}{1 \text{ mol}} \times 60.04 \text{ g/mol} = 120.04 \text{ g}$$

molar mass:

$$\begin{aligned} \text{C} &- 2 \times 12.01 = 24.02 \\ \text{H} &- 4 \times 1.01 = 4.04 \\ \text{O} &- 2 \times 15.99 = 31.98 \\ \hline &60.04 \end{aligned}$$

9. Convert 86.84 g of LiBr to moles:

$$\frac{86.84 \text{ g}}{86.84 \text{ g/mol}} = 1 \text{ mol}$$

molar mass:

$$\begin{aligned} \text{Li} &- 1 \times 6.94 = 6.94 \\ \text{Br} &- 1 \times 79.90 = 79.9 \\ \hline &86.84 \end{aligned}$$

10. Convert 8.045 g of H₂CO₃ to moles

$$\frac{8.045 \text{ g}}{62 \text{ g/mol}} = 0.13 \text{ mol}$$

molar mass:

$$\begin{aligned} \text{H} &- 2 \times 1.01 = 2.02 \\ \text{C} &- 1 \times 12.01 = 12.01 \\ \text{O} &- 3 \times 15.99 = 47.97 \\ \hline &62 \end{aligned}$$

11. How many cadmium atoms are there in 6.57 moles?

$$\frac{6.57 \text{ moles}}{1 \text{ mol}} \times 6.022 \times 10^{23} \text{ atoms/mol} = 3.96 \times 10^{24} \text{ atoms}$$

* atoms / molecules -- same idea!

12. How many moles of SO₂ are 4.5 × 10²⁴ molecules?

$$\frac{4.5 \times 10^{24} \text{ molecules}}{6.022 \times 10^{23} \text{ molecules/mol}} = 7.47 \text{ mol}$$