

Read pages 85-104, 107 When solving these problems show all steps and units

1. Calculate the moles in: (Example 4-7)

A. 40 g of calcium

$$40 \text{ g} \times \frac{1 \text{ mole}}{40.1 \text{ g}} = 1.0 \text{ mol}$$

B. 30 g of sulphur

$$30 \text{ g} \times \frac{1 \text{ mole}}{32.1 \text{ g}} = 0.93 \text{ mol}$$

2. Calculate the atoms in: (Example 4-6)

A. 50 g of gold

$$50 \text{ g} \times \frac{1 \text{ mole}}{197 \text{ g}} \times \frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mole}} = 1.5 \times 10^{23} \text{ atoms}$$

B. 50 g of silver

$$50 \text{ g} \times \frac{1 \text{ mole}}{107.9 \text{ g}} \times \frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mole}} = 2.8 \times 10^{23} \text{ atoms}$$

3. Calculate the moles in: (Example 4-2, 4-4)

A.  $4 \times 10^{36}$  atoms of sodium

$$4 \times 10^{36} \text{ atoms} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ atoms}} = 7 \times 10^{12} \text{ mol}$$

B.  $9.2 \times 10^{45}$  atoms of copper

$$9.2 \times 10^{45} \text{ atoms} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ atoms}} = 1.5 \times 10^{22} \text{ mol}$$

4. Calculate the moles of molecules in these diatomic gases (p. 107)

A. 33.3 g of nitrogen  $\text{N}_2$ 

$$33.3 \text{ g} \times \frac{1 \text{ mole}}{28.0 \text{ g}} = 1.19 \text{ mol}$$

B. 25 g of oxygen  $\text{O}_2$ 

$$25 \text{ g} \times \frac{1 \text{ mole}}{32.0 \text{ g}} = 0.78 \text{ mol}$$

5. Calculate the mass of 1 atom of: (Example 4-8)

A. Silver

$$1 \text{ atom} \times \frac{107.9 \text{ g/mole}}{6.02 \times 10^{23} \text{ atoms/mole}} = 1.79 \times 10^{-22} \text{ g/atom}$$

B. Copper

$$1 \text{ atom} \times \frac{63.5 \text{ g}}{6.02 \times 10^{23} \text{ atoms}} = 1.05 \times 10^{-22} \text{ g/atom}$$

6. Calculate the mass of:

A.  $2.5 \times 10^{25}$  atoms of aluminium

$$2.5 \times 10^{25} \text{ atoms} \times \frac{27.0 \text{ g}}{6.02 \times 10^{23} \text{ atoms}} = 1.1 \times 10^3 \text{ g}$$