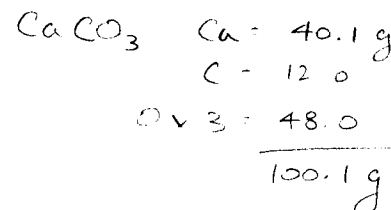


Read pages 95-104 When solving these problems show all steps and units

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

A. 40 g of calcium carbonate

$$\frac{1 \text{ mole}}{100.1} \times 40 \text{ g} = 0.40 \text{ mole}$$

B. 30 g of  $\text{NaNO}_3$ 

$$\frac{1 \text{ mole}}{85.0 \text{ g}} \times 30 \text{ g} = 0.35 \text{ mole}$$

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

A. 50 g of  $\text{CuCl}_2$ 

# atoms/molecule = 3

$$50 \text{ g} \times \frac{1 \text{ mol}}{134.5 \text{ g}} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \times \frac{3 \text{ atoms}}{1 \text{ molecule}} = 6.7 \times 10^{23} \text{ atoms}$$

B. 50 g silver oxide  $\text{Ag}_2\text{O}$ 

# atoms/molecule = 3

$$50 \text{ g} \times \frac{1 \text{ mol}}{231.8 \text{ g}} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} \times \frac{3 \text{ atoms}}{1 \text{ molecule}} = 3.9 \times 10^{23} \text{ atoms}$$

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

A.  $4 \times 10^{36}$  particle units of  $\text{FeCl}_3$  = molecules.

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

B.  $9.2 \times 10^{45}$  particle units of barium sulphate

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

4. Calculate the moles of molecules in this gas (Example 4-7)

A. 33.3 g of hydrogen chloride  $\text{HCl}$   $1.0 + 35.5 \text{ g} = 36.5 \text{ g}$ 

$$\frac{1 \text{ mole}}{36.5 \text{ g}} \times 33.3 \text{ g} = 0.912 \text{ mol}$$

5. How many iron atoms are in 5.33 moles of iron (III) chloride.
- $\text{FeCl}_3$

$$\frac{6.02 \times 10^{23} \text{ atoms}}{1 \text{ mole}} \times 5.33 \text{ moles} = 3.21 \times 10^{24} \text{ atoms}$$

6. Calculate the mass of 1 molecule of: (Example 4-8)

A. water  $\text{FW of H}_2\text{O} = 2(1.0) + 16.0 = 18.0 \text{ g}$ 

$$1 \text{ molecule of H}_2\text{O} \times \frac{18.0 \text{ g}}{6.02 \times 10^{23} \text{ molecules}} = 2.99 \times 10^{-23} \text{ g}$$

B. mercury (II) chloride

$$1 \text{ molecule of HgCl}_2 \times \frac{271.6 \text{ g}}{6.02 \times 10^{23} \text{ molecules}} = 4.51 \times 10^{-22} \text{ g}$$

7. Calculate the mass of: to make

A.  $2.5 \times 10^{25}$  atoms of aluminium carbonate $\text{Al}_2(\text{CO}_3)_3$  = 14 atoms/molecule

$$2.5 \times 10^{25} \text{ atoms} \times \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ molecules}} \times \frac{234.0 \text{ g}}{1 \text{ mole}} = 6.9 \times 10^2 \text{ g}$$

Na = 23.0 g

N = 14.0 g

O x 3 = 48.0 g

35.0 g

Cu = 63.5 g

Cl x 2 = 71.0 g

134.5 g

Ag x 2 = 215.8 g

O = 16.0 g

231.8 g

2(27.0) = 54.0 g

3(12.0) = 36.0 g

4(16.0) = 64.0 g

234.0 g