

Question 1: How many moles of glucose are in 7.8×10^{24} molecules of glucose?

$$7.8 \times 10^{24} \text{ molecules} \times \frac{1 \text{ mol glucose}}{6.02 \times 10^{23} \text{ molecules}} = \boxed{13 \text{ moles of glucose}}$$

Question 2: How many molecules of carbon dioxide are in 10.2 moles of carbon?

$$10.2 \text{ mol} \times \frac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = \boxed{6.14 \times 10^{24} \text{ molecules of CO}_2}$$

Question 3: Using the periodic table, calculate the molar mass of each substance below to the hundredths place.

1. table salt (NaCl) 58.44 g/mol
2. aspirin ($\text{C}_9\text{H}_8\text{O}_4$) 180.16 g/mol
3. caffeine ($\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$) 194.19 g/mol
4. baking soda (NaHCO_3) 84.00 g/mol
5. Mg(OH)_2 58.32 g/mol

Question 4: Perform the following molar mass conversions.

1. What is the mass in grams of 5.00 moles of CH_4 ?

$$5.00 \text{ mol CH}_4 \times \frac{16.04 \text{ g CH}_4}{1 \text{ mol CH}_4} = \boxed{80.2 \text{ g CH}_4}$$

2. How many moles of oxygen gas O_2 , are present in a 38 g sample of O_2 ?

$$38 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32 \text{ g O}_2} = \boxed{1.2 \text{ mol O}_2}$$

3. How many grams are contained in a 12 mol sample of CaCO_3 ?

$$12 \text{ mol CaCO}_3 \times \frac{100.09 \text{ g CaCO}_3}{1 \text{ mol CaCO}_3} = \boxed{1200 \text{ g CaCO}_3}$$