

## Moles, Molecules, & Molar Masses

**1 mole =  $6.022 \times 10^{23}$  particles**  
**1 mole = molar mass**

1. Calculate the mass of 1.58 moles CH<sub>4</sub>. [molar mass CH<sub>4</sub> = 16.05 g/mol]

Given: 1.58 moles CH<sub>4</sub>

Unknown: ? g CH<sub>4</sub>

Will you use molar mass or  $6.02 \times 10^{23}$  to solve this problem?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

2. How many molecules are there in a 0.583 mole sample of H<sub>2</sub>O? [molar mass of H<sub>2</sub>O = 18.02 g/mol]

G: 0.583 moles H<sub>2</sub>O

U: ? molecules H<sub>2</sub>O

Will you use molar mass or  $6.02 \times 10^{23}$  to solve this problem?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

3. How many moles of  $5.79 \times 10^{20}$  molecules of CO<sub>2</sub>? [molar mass CO<sub>2</sub> = 44.01 g/mol]

G:  $5.79 \times 10^{20}$  molecules CO<sub>2</sub>

U: ? mole CO<sub>2</sub>

Will you use molar mass or  $6.02 \times 10^{23}$  to solve this problem?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

4. How many moles are in a 35.0 gram sample of H<sub>2</sub>O? [molar mass H<sub>2</sub>O = 18.02 g/mol]

G: 35.0 g H<sub>2</sub>O

U: ? moles H<sub>2</sub>O

Will you use molar mass or  $6.02 \times 10^{23}$  to solve this problem?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

5. How many grams of NaOH do you measure if you need 2.87 moles of NaOH?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

6. How many moles of NaCl are in  $2.11 \times 10^{24}$  particles of NaCl?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

7. How many molecules are present in 1.45 moles of H<sub>2</sub>O?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

8. If you have 10.33 grams of copper, how many moles of copper is that?

$$\text{_____} \bigg| \text{_____} = \text{_____}$$

9. If you have  $4.90 \times 10^{22}$  atoms of copper, how many grams of copper is that?

$$\text{_____} \bigg| \text{_____} \bigg| \text{_____} = \text{_____}$$

10. Calculate the molar mass of Al(C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>)<sub>3</sub>.

g/mol