

### 3 • Molecules & Compounds

#### Mole Calculations - Difficulty Level 1

<b>1 mole = <math>6.02 \times 10^{23}</math> molecules = 22.4 L (@ STP)</b>
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1. Calculate the mass of 1.58 moles  $\text{CH}_4$ . [molar mass  $\text{CH}_4$  = 16.0 g/mol]

G: 1.58 moles  $\text{CH}_4$

D: ? g  $\text{CH}_4$

$$\frac{1.58 \text{ moles } \text{CH}_4}{\quad} =$$

2. What volume will 7.29 moles of  $\text{CO}_2$  gas occupy at STP?

G: 7.29 moles  $\text{CO}_2$

D: ? L  $\text{CO}_2$

$$\frac{7.29 \text{ moles } \text{CO}_2}{\quad} =$$

3. How many molecules are there in a 0.00583 mole sample of  $\text{H}_2\text{O}$ ?

G: 0.00583 moles  $\text{H}_2\text{O}$

D: ? molecules  $\text{H}_2\text{O}$

$$\frac{0.00583 \text{ moles } \text{H}_2\text{O}}{\quad} =$$

4. What mass of  $\text{CO}_2$  gas occupies a volume of 100. Liters at STP? [molar mass  $\text{CO}_2$  = 44.0 g/mol]

G: 100. Liters  $\text{CO}_2$

D: ? g  $\text{CO}_2$

$$\frac{100. \text{ Liters } \text{CO}_2}{\quad} =$$

5. How many molecules are in a 35.0 gram sample of  $\text{H}_2\text{O}$ ? [molar mass  $\text{H}_2\text{O}$  = 18.0 g/mol]

G: 35.0 g  $\text{H}_2\text{O}$

D: ? molecules  $\text{H}_2\text{O}$

$$\frac{35.0 \text{ g } \text{H}_2\text{O}}{\quad} =$$

6. What volume will  $5.25 \times 10^{22}$  molecules of  $\text{CH}_4$  occupy at STP?

G:  $5.25 \times 10^{22}$  molecules  $\text{CH}_4$

D: ? L

$$\frac{5.25 \times 10^{22} \text{ molecules } \text{CH}_4}{\quad} =$$

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#### Mole Calculations - Difficulty Level 2

$$1 \text{ mole} = 6.02 \times 10^{23} \text{ molecules} = 22.4 \text{ L (@ STP)}$$

1. Calculate the mass of 2.19 moles  $\text{CH}_4$ . [molar mass  $\text{CH}_4 = 16.0 \text{ g/mol}$ ]

G:

D:

$$\text{_____} =$$

2. What volume will 2.22 moles of  $\text{CO}_2$  gas occupy at STP?

G:

D:

$$\text{_____} =$$

3. How many molecules are there in a 0.127 mole sample of  $\text{H}_2\text{O}$ ?

G:

D:

$$\text{_____} =$$

4. What mass of  $\text{CO}_2$  gas occupies a volume of 395 Liters at STP? [molar mass  $\text{CO}_2 = 44.0 \text{ g/mol}$ ]

G:

D:

$$\text{_____} =$$

5. How many molecules are in a 0.250 gram sample of  $\text{H}_2\text{O}$ ? [molar mass  $\text{H}_2\text{O} = 18.0 \text{ g/mol}$ ]

G:

D:

$$\text{_____} =$$

6. What volume will  $3.01 \times 10^{22}$  molecules of  $\text{CH}_4$  occupy at STP?

G:

D:

$$\text{_____} =$$

### 3 • Molecules & Compounds

#### Mole Calculations - Difficulty Level 3

$$1 \text{ mole} = 6.02 \times 10^{23} \text{ molecules} = 22.4 \text{ L (@ STP)}$$

1. Calculate the mass of 7.23 moles  $\text{CH}_4$ . [molar mass  $\text{CH}_4 = 16.0 \text{ g/mol}$ ]  
G:  
D:
  
2. What volume will 9.35 moles of  $\text{CO}_2$  gas occupy at STP?  
G:  
D:
  
3. How many molecules are there in a 0.0752 mole sample of  $\text{H}_2\text{O}$ ?  
G:  
D:
  
4. What mass of  $\text{CO}_2$  gas occupies a volume of 10.8 Liters at STP? [molar mass  $\text{CO}_2 = 44.0 \text{ g/mol}$ ]  
G:  
D:
  
5. How many molecules are in a 1.44 gram sample of  $\text{H}_2\text{O}$ ? [molar mass  $\text{H}_2\text{O} = 18.0 \text{ g/mol}$ ]  
G:  
D:
  
6. What volume will  $1.21 \times 10^{24}$  molecules of  $\text{CH}_4$  occupy at STP?  
G:  
D: