South Pasadena • Chemistry

Name _____
Period ___ Date ___/___/___

Unit 2 • Moles, Molecules, & Molar Masses

Mole Calculations - Difficulty Level 1

1 mole = 6.02 x 10^{23} molecules = 22.4 L (@ STP)

1. Calculate the mass of 1.58 moles CH_4. [molar mass CH_4 = 16.00 g/mol]
   G: 1.58 moles CH_4
   D: ? g CH_4

   1.58 moles CH_4 × ——————— =

2. What volume will 7.29 moles of CO_2 gas occupy at STP?
   G: 7.29 moles CO_2
   D: ? L CO_2

   7.29 moles CO_2 × ——————— =

3. How many molecules are there in a 0.00583 mole sample of H_2O?
   G: 0.00583 moles H_2O
   D: ? molecules H_2O

   0.00583 moles H_2O × ——————— =

4. What mass of CO_2 gas occupies a volume of 100. Liters at STP? [molar mass CO_2 = 44.01 g/mol]
   G: 100. Liters CO_2
   D: ? g CO_2

   100. Liters CO_2 × ——————— × ——————— =

5. How many molecules are in a 35.0 gram sample of H_2O? [molar mass H_2O = 18.02 g/mol]
   G: 35.0 g H_2O
   D: ? molecules H_2O

   35.0 g H_2O × ——————— × ——————— =

6. What volume will 5.25 x 10^{22} molecules of CH_4 occupy at STP?
   G: 5.25 x 10^{22} molecules CH_4
   D: ? L

   5.25 x 1022 molecules CH_4 × ——————— × ——————— =

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Mole Calculations - Difficulty Level 2

1 mole = 6.02 x 10^{23} molecules = 22.4 L (@ STP)

1. Calculate the mass of 2.19 moles CH_4. [molar mass CH_4 = 16.0 g/mol]
   G:
   D:

   $\times \frac{\qquad}{\qquad} =$

2. What volume will 2.22 moles of CO_2 gas occupy at STP?
   G:
   D:

   $\times \frac{\qquad}{\qquad} =$

3. How many molecules are there in a 0.127 mole sample of H_2O?
   G:
   D:

   $\times \frac{\qquad}{\qquad} =$

4. What mass of CO_2 gas occupies a volume of 395 Liters at STP? [molar mass CO_2 = 44.0 g/mol]
   G:
   D:

   $\times \frac{\qquad}{\qquad} \times \frac{\qquad}{\qquad} =$

5. How many molecules are in a 0.250 gram sample of H_2O? [molar mass H_2O = 18.0 g/mol]
   G:
   D:

   $\times \frac{\qquad}{\qquad} \times \frac{\qquad}{\qquad} =$

6. What volume will 3.01 x 10^{22} molecules of CH_4 occupy at STP?
   G:
   D:

   $\times \frac{\qquad}{\qquad} \times \frac{\qquad}{\qquad} =$

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Unit 2 • Moles, Molecules, & Molar Masses

Mole Calculations - Difficulty Level 3

1 mole = 6.02 x 10^{23} molecules = 22.4 L (@ STP)

1. Calculate the mass of 7.23 moles CH_4. [molar mass CH_4 = 16.0 g/mol]
   G:
   D:

2. What volume will 9.35 moles of CO_2 gas occupy at STP?
   G:
   D:

3. How many molecules are there in a 0.0752 mole sample of H_2O?
   G:
   D:

4. What mass of CO_2 gas occupies a volume of 10.8 Liters at STP? [molar mass CO_2 = 44.0 g/mol]
   G:
   D:

5. How many molecules are in a 1.44 gram sample of H_2O? [molar mass H_2O = 18.0 g/mol]
   G:
   D:

6. What volume will 1.21 x 10^{24} molecules of CH_4 occupy at STP?
   G:
   D: