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| **Molar Volume** | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**WHAT IS VOLUME?**

* The amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that an object takes up
* A solid’s or liquid’s volume is determined by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of its particles
* At a higher temperature, particles are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, hitting each other and bouncing further apart
* Volume is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at higher temperatures

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| ***Mass of a mole of substance is called: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***  ***Volume of a mole of substance is called:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** |

**Avogadro’s Hypothesis**

* Equal volumes of different gases, measured the same temperature and pressure, have equal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Standard Temperature & Pressure

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| ***The molar volume at STP is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***  ***Conversion Factor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*** |

Example:

What is the volume of 1.3 mol of NO2 gas at STP?

Natural gas is used to heat many homes. It consists primarily of the gas methane, CH4. What is the mass of 8.9 L of CH4 at STP?

**Questions**: (use your Mole Maps to help!)

1. How many moles of SO2 are in 9.5 L of SO2 at STP?
2. 6.00 L of air at STP is compressed into a scuba tank. How many molecules of air are in the tank?
3. H2S gas is released from rotten eggs. What volume of H2S gas at STP contains 1.07g H2S?
4. In 1 mol of H2SO4…
   1. How many moles of hydrogen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. What is the ratio of # mol H2SO4 to # mol of hydrogen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. How many moles of sulfur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. What is the ratio of # mol H2SO4 to # mol of sulfur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. How many moles of oxygen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. What is the ratio of # mol H2SO4 to # mol of oxygen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. How many moles of **hydrogen** are in 6.0 moles of water?
6. How many moles of **carbon** are there in 14.0 moles of C3H8?
7. Fill in the missing entry in each conversion factor below to determine the mass of carbon in 2.0 L of propane, C3H8 at STP.

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| 2.0 L C3H8 | x | 1 mol C3H8 | x | \_\_\_\_\_\_\_\_\_\_\_mol C | x | \_\_\_\_\_\_\_\_\_\_ g C | = |
| 1 | \_\_\_\_\_\_\_\_\_\_\_L C3H8 | 1 mol C3H8 | 1 mol C |

1. What volume of CO2 at STP contains 0.20 g of carbon?