Chemistry 11

Mole IV

Name:
Date:
Block:

1. **Molar Volume**
2. **Molar Concentration**

Molar Volume

WHAT IS VOLUME?

- The _____ _____ _____ that an object takes up
- A solid's or liquid's volume is determined by the _____ and _____ of its particles
- At higher temperatures, particles are _____ _____, hitting each other and bouncing _____ _____
- Volume is _____ at higher temperatures

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 at the same temperature and pressure, have _____ _____
- Standard Temperature & Pressure
  -
  -

The molar volume at STP is:

_____

Conversion Factor:

_____

Example:

1. What is the volume of 1.3 mol of NO_2 at STP?

2. What volume of oxygen gas at STP contains 2.33 mol of O_2?

3. Natural gas is used to heat many homes. It consists primarily of methane, CH_4. What is the mass of 8.9 L of CH_4 at STP?

4. How many moles of SO_2 are in 9.5 L of SO_2 at STP?

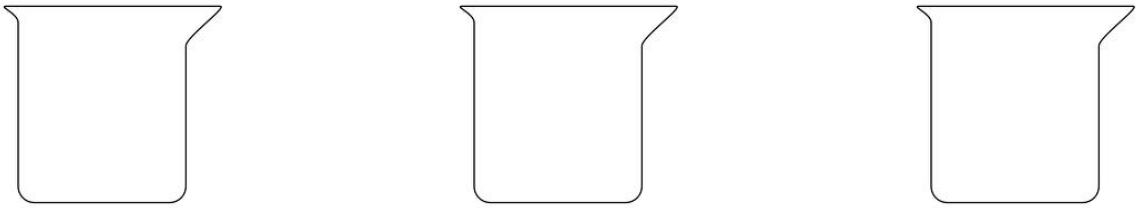
5. 6.00 L of air at STP is compressed into a scuba tank. How many moles of air are in the tank?

6. Silicon dioxide, better known as quartz, has a molar volume of 22.8 cm^3/mol. What is the volume of 0.39 mol of SiO_2?

7. H_2S gas is released from rotten eggs. What volume of H_2S gas at STP contains 17.0 g H_2S?

Molar Concentration

What is "concentration"?



Solute =

Solvent =

Molarity (M) = number of moles of the chemical per litre of solution

Conversion factor =

Example 1:
What does 2.0 M NaOH mean?

Example 2:
Which solution has more solvent per litre: 5.0 M HCl or 10. M HCl?

Which solution is more concentrated?

Example 3:
The average concentration of seawater is 0.60M. How many moles of salt are in a bucket containing 435 mL of seawater?

Example 4:
What volume of 3.0M HCl should a chemist dispense to obtain 0.25 mol HCl?

Example 5:
How many mol are in 0.72 L of 2.5 M of NaOH?

Example 6:
What molar concentration of KCl is produced by measuring out 1.0 g KCl and adding water to make a .350 L solution?

Practice Problems:

8. What mass of calcium chloride would you need to prepare 500.0 mL with a concentration of 1.5 M?

9. What mass of KCl would be recovered if 55 mL of 0.20 M KCl were "evaporated to dryness"?

10. What molar concentration of silver nitrate is produced by measuring out 1.8 g and then adding water to make 75 mL of solution?

1. 29 L 2. 52.5 L 3. 6.4 g 4. 0.42 mol 5. 0.268 mol 6. 8.9 cm^3 7. 11.2 L 8. 83 g 9. 0.82 g 10. 0.14 M