

## Section 7: Review and Discussion Questions (In Progress)

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State the Law of Combining Volumes and provide an example of your own construction which demonstrates this law.

Explain how the Law of Combining Volumes, combined with the Atomic-Molecular Theory, leads directly to Avogadro's Hypothesis that equal volumes of gas at equal temperatures and pressure contain equal numbers of particles.

Use Avogadro's Hypothesis to demonstrate that oxygen gas molecules cannot be monatomic.

The density of water vapor at room temperature and atmospheric pressure is 0.737g/L

- Compound A is 80.0% carbon by mass, and 20.0% hydrogen. Compound B is 83.3% carbon by mass and 16.7% hydrogen. The density of gaseous Compound A is 1.227g/L, and the density of Compound B is 2.948g/L
- Show how these data can be used to determine the molar masses of Compounds A and B, assuming that water has molecular mass 18.

From the results above, determine the mass of carbon in a molecule of Compound A and in a molecule of Compound B. Explain how these results indicate that a carbon atom has atomic mass 12.

Explain the utility of calculating the number of moles in a sample of a substance.

Explain how we can conclude that 28g of nitrogen gas (N<sub>2</sub>)

) contains exactly as many molecules as 32g of oxygen gas (O<sub>2</sub>), even though we cannot possibly count this number.

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