

Section 14.3 The Ideal Gas Law

In your textbook, read about the ideal gas law.

Answer the following questions.

1. Why is the mathematical relationship among the amount, volume, temperature, and pressure of a gas sample called the ideal gas law?

2. Define the ideal gas constant, R.

3. In Table 14-1 in your textbook, why does R have different numerical values?

4. What variable is considered in the ideal gas law that is not considered in the combined gas law?

In your textbook, read about real versus ideal gases.

For each statement below, write *true* or *false*.

- _____ 5. An ideal gas is one whose particles take up space.
- _____ 6. At low temperatures, ideal gases liquefy.
- _____ 7. In the real world, gases consisting of small molecules are the only gases that are truly ideal.
- _____ 8. Most gases behave like ideal gases at many temperatures and pressures.
- _____ 9. No intermolecular attractive forces exist in an ideal gas.
- _____ 10. Nonpolar gas molecules behave more like ideal gases than do gas molecules that are polar.
- _____ 11. Real gases deviate most from ideal gas behavior at high pressures and low temperatures.
- _____ 12. The smaller the gas molecule, the more the gas behaves like an ideal gas.

Section 14.3 *continued*

In your textbook, read about applying the ideal gas law.

Rearrange the ideal gas law, $PV = nRT$, to solve for each of the following variables.

Write your answers in the table.

Rearranging the Ideal Gas Law Equation	
Variable to Find	Rearranged Ideal Gas Law Equation
n	13.
P	14.
T	15.
V	16.

In your textbook, read about using the ideal gas law to solve for molar mass, mass, or density.

Use the following terms below to complete the statements. Each term may be used more than once.

mass

molar mass

volume

The number of moles of a gas is equal to the **(17)** _____ divided by the **(18)** _____.

Density is defined as **(19)** _____ per unit **(20)** _____.

To solve for M in the equation $M = \frac{mRT}{PV}$, the **(21)** _____ and the **(22)** _____ of the gas must be known.

According to the equation $D = \frac{MP}{RT}$, the **(23)** _____ of the gas must be known when calculating density.