

14.3 Ideal gases

Vocabulary

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

The ideal gas law permits you to solve for the 1 of a contained gas when the pressure, volume, and temperature are known. The ideal gas law is described by the formula 2 where the variable 3 represents the number of moles of gas and the letter R is the 4. R is equal to 5.

1. _____

2. _____

3. _____

4. _____

5. _____

A gas that conforms to the gas laws at all conditions of temperature and pressure is an 6 gas. No 7 gas behaves ideally at all temperatures and pressures. Deviations from ideal behavior at high pressures can be explained by the intermolecular 8 between particles in a gas and the actual 9 of the particles.

6. _____

7. _____

8. _____

9. _____

Ideal Gases –

- Gases whose behavior can be predicted by the kinetic molecular theory are called _____, or perfect, gases. No gases are truly ideal because no gas totally obeys all of the _____.
- An ideal gas is an _____ gas that is _____ and does follow everything perfectly.
- We assume that all gases behave like _____ so there is an ideal gas law.

$$PV = nRT$$

What do the variables stand for?

IDEAL GAS LAW PROBLEMS

1. How many moles of gas are present in a rigid 0.500 L container under 1.5 atm of pressure and 100.°C?
2. What volume will 2.00 moles of nitrogen occupy at 0.80 atm and 20.°C?
3. What pressure will be exerted by 4.5 moles of oxygen at 25.0°C and a volume of 0.500 L?
4. Calculate how many moles of methane gas (CH₄) are in 4.00 L of the gas at 22°C and 1.10 atm.
5. At what temperature will 5.00g of Cl₂ exert a pressure of 1.70 atm at a volume of .750 L? (hint: convert grams to moles)
6. How many moles of nitrogen gas will occupy a volume of 347 mL at 6680 torr and 27°C?