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Crash Course Chemistry #13: Ideal Gas Problems

Name: _____ Date: _____

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1. The **ideal gas law** assumes that gas particles have no _____ and no attraction to each other.
2. Boyle's Law states that pressure and _____ of a gas are inversely related at constant temperature.
3. Charles' Law involves a direct relationship between volume and _____ at constant pressure.
4. Avogadro's Law links volume and the _____ of gas, assuming constant temperature and pressure.
5. The **ideal gas law** formula is written as $PV = nRT$, where **R** is the _____ gas constant.
6. At Standard Temperature and Pressure (STP), the temperature is _____ Kelvin.
7. The value of the universal gas constant **R** is 8.3145 when using units of L·kPa/mol·K.
8. Gases deviate from ideal behavior at high pressure and _____ temperature.
9. The three laws—Boyle's, Charles', and Avogadro's—were combined into one by _____ Mendeleev.
10. The unit of volume in the ideal gas law is typically expressed in _____.
11. The volume occupied by 1.00 mole of gas at STP (100 kPa) is approximately _____ liters.
12. The molar mass of hydrogen gas (H_2) is approximately _____ grams per mole.
13. Increasing pressure in a gas system typically leads to an increase in _____.
14. The fire piston demonstrates that compression raises the _____ of gas inside.
15. Johannes van der Waals developed a correction for real gases by accounting for size and _____ between particles.

Crash Course Chemistry #13: Ideal Gas Problems KEY

1. The **ideal gas law** assumes that gas particles have no **size** and no attraction to each other.
2. Boyle's Law states that pressure and **volume** of a gas are inversely related at constant temperature.
3. Charles' Law involves a direct relationship between volume and **temperature** at constant pressure.
4. Avogadro's Law links volume and the **amount** of gas, assuming constant temperature and pressure.
5. The **ideal gas law** formula is written as $PV = nRT$, where **R** is the **universal** gas constant.
6. At Standard Temperature and Pressure (STP), the temperature is **273.15** Kelvin.
7. The value of the universal gas constant **R** is 8.3145 when using units of L·kPa/mol·K.
8. Gases deviate from ideal behavior at high pressure and **low** temperature.
9. The three laws—Boyle's, Charles', and Avogadro's—were combined into one by **Dmitri Mendeleev**.
10. The unit of volume in the ideal gas law is typically expressed in **liters**.
11. The volume occupied by 1.00 mole of gas at STP (100 kPa) is approximately **22.7** liters.
12. The molar mass of hydrogen gas (H_2) is approximately **2.016** grams per mole.
13. Increasing pressure in a gas system typically leads to an increase in **temperature**.
14. The fire piston demonstrates that compression raises the **temperature** of gas inside.
15. Johannes van der Waals developed a correction for real gases by accounting for size and **attraction** between particles.

15 Questions

Answer Key Included

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