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# GAS LAWS

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# TABLE OF CONTENTS

- 1** UNITS & CONVERSION FACTORS
- 2** BOYLE'S LAW
- 3** CHARLES' LAW
- 5** GAY-LUSSAC'S LAW
- 6** COMBINED GAS LAW
- 8** HOW TO USE STP
- 10** AVOGADRO'S LAW
- 11** IDEAL GAS LAW
- 13** IDEAL GAS LAW & MOLECULAR FORMULAS
- 17** DENSITY OF A GAS
- 19** MOLAR MASS OF A GAS
- 21** GAS STOICHIOMETRY
- 27** DALTON'S LAW OF PARTIAL PRESSURES
- 34** COLLECTED OVER WATER
- 35** MANOMETERS

# 2

# BOYLE'S LAW

Relates Pressure and Volume

↑ Increase Pressure

↓ Decrease Volume

Formula:  $P_1 V_1 = P_2 V_2$

## Example:

A sample of gas has an initial volume of 13.9 L at a pressure of 1.22 atm. If the sample compressed to a volume of 10.3 L, What is its pressure?

Given  $P_1 = 1.22 \text{ atm}$   $V_2 = 10.3 \text{ L}$

Find  $P_2$

$V_1 = 13.9 \text{ L}$

Step 1: Plug into formula  $P_1 V_1 = P_2 V_2$

$$(1.22 \text{ atm}) (13.9 \text{ L}) = P_2 (10.3 \text{ L})$$

Step 2: Multiply Left Side

$$16.958 \text{ atm L} = P_2 (10.3 \text{ L})$$

Step 3: Divide 10.3 to both sides

$$\frac{16.958 \text{ atm L}}{10.3 \text{ L}} = \frac{P_2 (10.3 \text{ L})}{10.3 \text{ L}}$$

Liters cancel and we are left with atm, since we are solving for pressure.

Step 4: Round to 3 sig figs since given values were all 3 sig figs.

Answer:  $P_2 = 1.65 \text{ atm}$