

## Charles's Law

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

- 1) If I have 45 liters of helium in a balloon at 25° C and increase the temperature of the balloon to 55° C, what will the new volume of the balloon be?

$$\frac{45}{25} = \frac{x}{55}$$

$$(99 \text{ L})$$

$$\times \frac{18}{55} = \frac{x}{55} \times 55$$

- 2) Calcium carbonate decomposes at 1200° C to form carbon dioxide and calcium oxide. If 25 liters of carbon dioxide are collected at 1200° C, what will the volume of this gas be after it cools to 25° C?

$$\frac{25}{1200} = \frac{x}{25}$$

$$= \frac{x}{25}$$

$$(52 \text{ L})$$

- 3) I have 130 liters of gas in a piston at a temperature of 250° C. If I cool the gas until the volume decreases to 85 liters, what will temperature of the gas be?

$$\frac{130}{250} = \frac{85}{x}$$

$$= \frac{85}{x}$$

$$\frac{21250}{130} = x$$

$$85 \times 250$$

$$(163^\circ \text{C} \text{ or } 436^\circ \text{K})$$