Charles's Law

1)   If I have 45 liters of helium in a balloon at 25^0 C and increase the temperature of the balloon to 55^0 C, what will the new volume of the balloon be?

2)   Calcium carbonate decomposes at 1200^0 C to form carbon dioxide and calcium oxide. If 25 liters of carbon dioxide are collected at 1200^0 C, what will the volume of this gas be after it cools to 25^0 C?

3)   I have 130 liters of gas in a piston at a temperature of 250^0 C. If I cool the gas until the volume decreases to 85 liters, what will temperature of the gas be?

Charles's Law – Solutions

1) If I have 45 liters of helium in a balloon at 25^0 C and increase the temperature of the balloon to 55^0 C, what will the new volume of the balloon be?

$$\frac{45L}{298K} = \frac{x}{328K}$$
$$x = 50L$$

2) Calcium carbonate decomposes at 1200^0 C to form carbon dioxide and calcium oxide. If 25 liters of carbon dioxide are collected at 1200^0 C, what will the volume of this gas be after it cools to 25^0 C?

$$\frac{25L}{1473K} = \frac{x}{298K}$$
$$x = 5.1L$$

3) I have 130 liters of gas in a piston at a temperature of 250^0 C. If I cool the gas until the volume decreases to 85 liters, what will temperature of the gas be?

$$\frac{130L}{523K} = \frac{85L}{x}$$
$$x = 340K$$
$$x = 69^0 C$$