Charles' Law

Charles' Law relates the temperature and volume of a gas (when the pressure remains constant).

If pressure remains constant, the higher the temperature the larger the volume (because a gas expands when heated).

Mathematically, temperature is proportional to volume.

$$\frac{V}{T} = constant$$

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

Important: The temperature needs to be in Kelvin rather than degrees. (Kelvin temperature = Degrees + 273)

Problems (note: the pressure remains constant in each case):

1) A container holds 50 cm^3 of nitrogen at 25°C (298K) and a pressure of 1 atmosphere. What will its volume be if the temperature is increased by 35°C?

2) A sample of oxygen occupies a volume of 160 cm^3 at 91°C. What will the volume be when the temperature drops to 0°C?

3) A sample of hydrogen has an initial temperature of 50°C. When the temperature is lowered to -5°C, the volume becomes 212cm^3. What was the initial volume of the gas?

4) 568cm^3 of chlorine at 25°C will occupy what volume at -25°C?