Answer on Question #75815, Chemistry / General Chemistry

A sample of helium gas with a pressure of 260 Torr at 0 °C is heated to give a pressure of 1600 Torr. Calculate the final temperature, in degrees Celsius, for each of the following, if n and V do not change.

Solution

If V is constant, then according to Charles's law:

$\frac{P_1}{T_1} = \frac{P_2}{T_2}$; or $P_1T_2 = P_2T_1$

$T_2 = \frac{P_2T_1}{P_1} = \frac{1600 \times 273}{260}$ = 1680 (K) = **1407 (°C)**

Answer

A sample of helium gas with a pressure of 260 Torr at 0 °C is heated to **1407°C** to give a pressure of 1600 Torr.