Answer on Question #83641 – Chemistry | General Chemistry

A container holds 50.0 ml of nitrogen at 25 Celsius and a pressure of 736 mm Hg. What will be its volume if the temperature increases by 35 Celsius?

Solution

$V_1 = 50.0\ ml$

$T_1 = 25\ °C = 25°C + 273 = 298\ K$ (Kelvin)

$T_2 = 25°C + 35°C + 273 = 333\ K$

$P_1 = P_2 = 736\ mm\ Hg$

$$Charle's\ Law: \quad \frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$V_2 = \frac{V_1 \cdot T_2}{T_1} = \frac{50.0\ ml \cdot 333K}{298K} = 55.9\ ml$$

Answer

Volume must be 55.9 ml