

Answer on Question #74196 Physics / Other

A gas has a volume of $V_1 = 600.0$ ml at $t_1 = -20.0^\circ\text{C}$ and $p_1 = 200.0$ torr. what would the volume of the gas be at $t_2 = 220.0^\circ\text{C}$ and $p_2 = 580$ torr?

Solution:

Equation of states for ideal gas

$$pV = \nu RT$$

So

$$\frac{p_1 V_1}{T_1} = \frac{p_2 V_2}{T_2}$$

$$V_2 = \frac{p_1}{p_2} \times \frac{T_2}{T_1} \times V_1$$

$$V_2 = \frac{200}{580} \times \frac{220 + 273}{-20 + 273} \times 600 = 403 \text{ ml}$$

Answer: $V_2 = 403$ ml

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