

Gas Problems - Example Of Showing Work

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Charles' Law Problem

A gas is held in a 3.45E3mL container and has a temperature of 25.1degC. If you raise the temperature of gas to 78.4degC, what is the new volume of the gas (unit of L)?

2 conditions (const P+n)

$$V_1 = 3.45 \times 10^3 \text{ mL} \left(\frac{1 \text{ L}}{1000 \text{ mL}} \right) = 3.45 \text{ L}$$

$$T_1 = 25.1^\circ\text{C} + 273 = 298.1 \text{ K}$$

$$T_2 = 78.4^\circ\text{C} + 273 = 351.4 \text{ K}$$

$$V_2 = ?$$

$$V_2 = V_1 \left(\frac{T_2}{T_1} \right)$$

$$V_2 = (3.45 \text{ L}) \left(\frac{351.4 \text{ K}}{298.1 \text{ K}} \right)$$

$$V_2 = 4.066 \text{ L}$$

$$V_2 = 4.07 \text{ L}$$

If need to do this, put in box.

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

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