Question #85507, Chemistry / General Chemistry

A gas in a piston starts out with a volume of 156mL, a temperature of 28.1 degrees Celsius, and a pressure of 1.12atm. If it ends with a volume of 312mL and a temperature of 87.2 degrees Celsius, what is the new pressure?

Solution

According to the ideal gas law for the same amount of gas:

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2} \; ;$$

Then

$P_2 = \frac{P_1 \times V_1 \times T_2}{V_2 \times T_1}$, where $T_1 = 301.1$ K; $T_2 = 360.2$ K

$P_2 = \frac{1.12 \times 156 \times 360.2}{312 \times 301.1} =$ **0.67 (atm)**

Answer

0.67 atm is the new pressure of gas in a piston.