

#80757 Chemistry, Other

A gas fills a 100 mL cylinder fitted with a piston at a particular temperature and pressure. If the volume of the gas is halved by pushing in the piston, and at the same time the absolute temperature is doubled, what will happen to the pressure of the gas?

(Show all calculations)

Answer:

According to Boyle's law: $P_1V_1/T_1 = P_2V_2/T_2$

Let's say, that initial temperature is 1. When it is doubled, it will be equal to 2. Therefore:

$$P_1 \cdot 100/1 = P_2 \cdot 50/2 \text{ or } 100 P_1 = 25 P_2$$

This indicates that pressure in the system will have a 4-time rise.