Answer on Question #69283 - Chemistry / General Chemistry

An ideal gas is allowed to expand from 6.00 L to 15.0 L at constant temperature. By what factor does the volume increase? If the intial pressure was 133 atm, what is the final pressure?

Solution:

If the gas increases in volume at constant temperature, then there is a decrease in pressure.

T=const, so we have isothermal process.

The isothermal process is obeyed to the Boyle's law:

$$P_1 V_1 = P_2 V_2$$

$$6l \cdot 133atm = 15l \cdot P_2, \qquad P_2 = \frac{6l \cdot 133atm}{15l} = 53.2 \ atm.$$

Answer: $\mathbf{53.2 \ atm}$.