Answer on Question #60477-Physics-Molecular Physics-Thermodynamics

Two vessels having volume of 5 liters and 3 liters contain air at pressure of 3 atmosphere and 7 atmospheres resp. What will be the resultant pressure when they are connected together with a small tube? Assume temperature remains constant throughout.

Solution

$$T = const \rightarrow pV = const$$

$$p_1 V_1 + p_2 V_2 = p(V_1 + V_2)$$

$$p = \frac{p_1 V_1 + p_2 V_2}{V_1 + V_2} = \frac{(5)(3) + (3)(7)}{5 + 3} = 4.5 \; atm$$

Answer: 4.5 atm.