#62685 Chemistry, General Chemistry

In the gas phase, acetic acid is at equilibrium with a dimer held together by a pair of hydrogen bonds. If the total pressure of acetic acid gas in a glass bulb is 0.519 bar, what is the partial pressure of the dimer?

Answer:

Dalton's Law of Partial Pressures states that the total pressure in a gas mixture is the sum of the partial pressures of each individual gas.

$$P_{total} = P_{gas\ a} + P_{gas\ b} + P_{gas\ c} + \text{etc}$$

In this case: $0.519 = P_{acetic\ acid} + P_{dimer}$

Since acetic acid is at equilibrium with a dimer their partial pressures are equal.

Therefore, partial pressure of the dimer is: $P_{dimer} = 0.519/2 = 0.2595$ bar.