

Dalton's Law of Partial Pressures

The total pressure of a combination of different gases is the same as the sum of the partial pressure contribution of each gas.

$$P_T = P_1 + P_2 + P_3 + \text{etc.}$$

$$P_{\text{atm}} = P_{\text{N}_2} + P_{\text{O}_2} + P_{\text{Ar}} + P_{\text{CO}_2} + P_{\text{etc}}$$

When a gas is collected "over water" the gas will pick up water vapour. (water vapour is a gas form of water) Therefore a gas collected over water is never pure.

$$P_T = P_{\text{gas}} + P_{\text{H}_2\text{O}}$$

The "vapour pressure" of water is temperature dependent. The temperature at which the gas is collected will decide what the partial pressure of H₂O will be. A table can be used to determine this number - See "Molar Mass of Butane Gas" lab for a table of vapour pressures for water.