

The ideal gas law is the equation of state of a hypothetical ideal gas. It is a good approximation to the behaviour of many gases under many conditions, although it has several limitations. It was first stated by Émile Clapeyron in 1834 as a combination of Boyle's law and Charles's law. The ideal gas law is often introduced in its common form:

$$PV = nRT$$

where P is the pressure of the gas, V is the volume of the gas, n is the amount of substance of gas (also known as number of moles), T is the temperature of the gas and R is the ideal, or universal, gas constant.

If you have sample of oxygen and only temperature (and volume) is changeable (R, n, P are constant), you can use formula of ideal gas low in a next form:

$$PV = nRT$$

$$V/T = nR/P$$

$$nR/P = \text{const}$$

$$V_1/T_1 = V_2/T_2$$

$$90\text{cm}^3 / (273+37) = V_2 / (273+0)$$

$$V_2 = 79.26 \text{ cm}^3$$