

Answer on Question #71073, Chemistry / Physical Chemistry:

A balloon containing 0.0400 mol of a gas with a volume of 500 mL was expanded to 1.00 L.

Answer the questions and round answers to nearest hundredth place.

Which equation should you use to find the amount of gas added. What is the final number of moles.

Solution.

$$v = 0.04 \text{ mol}$$

$$V = 500 \text{ ml} = 0.5 \text{ l}$$

$$V_1 = 1 \text{ l}$$

$$v_1 = ?$$

Isobaric process can be considered reversible if the system pressure matches the external pressure equal at all points in time process (that is, it is constantly in importance), and the temperature changes very slowly.

And:

$$pV = vRT$$

And the final number of moles:

$$\frac{pV}{pV_1} = \frac{vRT}{v_1RT}$$

$$\frac{V}{V_1} = \frac{v}{v_1}$$

$$v_1 = \frac{V_1 \cdot v}{V} = \frac{1 \text{ l} \cdot 0.04 \text{ mol}}{0.5 \text{ l}} = 0.08 \text{ mol}$$

$$v_1 = 0.08 \text{ mol}$$

Gas added:

$$\Delta v = v_1 - v = 0.08 \text{ mol} - 0.04 \text{ mol}$$

$$\Delta v = 0.04 \text{ mol}$$

Answer: $v_1 = 0.08 \text{ mol}$, $\Delta v = 0.04 \text{ mol}$.