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?

Answer:

The equation ruling ideal gas behavior is Clapeyron equation:
$$pV = nRT$$

R = 0.082 L·atm/ K·mol
Here we will assume that T=298 K.
Initial pressure in the balloon: $p = \frac{nRT}{V}$

$$p = \frac{0.0400 \cdot 0.082 \cdot 298}{0.500} = 1.955 \; atm$$

Taking into account that temperature and pressure indicators remained constant the amount of gas added:

$$n = \frac{pV}{RT}$$
$$n_1 = \frac{1.955 \cdot 1.00}{0.082 \cdot 298} = 0.080 \; mol$$

n_{final}=n-n_1=0.080-0.0400=0.04 mol
Therefore, 0.040 moles of gas was added to balloon.