

Answer on Question#60614 – Chemistry – General chemistry

Question: An aerosol can with a volume of 445 mL contains 0.355 grams of propane (C₃H₈) as a propellant. What is the pressure inside the can at 27 degrees Celsius?

Solution:

$$n(\text{C}_3\text{H}_8) = \frac{m(\text{C}_3\text{H}_8)}{M(\text{C}_3\text{H}_8)} = \frac{0.355 \text{ g}}{44 \text{ g/mol}} = 0.008 \text{ mol}$$

$$p = \frac{nRT}{V} = \frac{0.008 \text{ mol} \cdot 8.314 \frac{\text{J}}{\text{mol}\cdot\text{K}} \cdot (27+273)\text{K}}{445 \cdot 10^{-6} \text{ m}^3} = 44840 \text{ Pa} = 44.8 \text{ kPa} = 0.443 \text{ atm}$$

Answer: 44.8 kPa or 0.443 atm.