

A recently filled 4.60 L gas cylinder has a pressure of 212 atm at room temp (25 degrees C). At what temp. would the gas reach the potentially dangerous pressure of  $2.28 \times 10^5$  torr?

**Solution:**

Gas will be really dangerous when its volume is closer to the volume of a cylinder, that is, the value of 4.60 L.

We calculate the temperature of gas by Gay-Lussac's law:  $\frac{P_1}{P_2} = \frac{T_1}{T_2}$ , where P – pressure, atm., T –

temperature, K, V-const.

We convert the pressure from torr to atm. As we know, the torr is defined as  $\frac{1}{760}$  atm. exactly. So, the  $2.28 \cdot 10^5$  torr is equal to  $2.28 \cdot 10^5 / 760 = 300$  atm.

$$T_2 = \frac{300 \cdot 298}{212} = 421\text{K or } 148.7^\circ\text{C} .$$

**Answer:**

The temperature of gas is  $148.7^\circ\text{C}$ .