Example(2): A certain mass of gas occupies 617cm^3 at 9℃. What is the volume at 0℃ under the same pressure?

Solution: :

Initial state	**Final state**
$V_1 = 617\ cm^3$	$V_2 =$?
$T_1 =$ 9℃ + 273$= 282\ K$	$T_2 =$ 0℃ + 273 = $273\ K$

Using Charles' Law, $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

$$V_2 = \frac{V_1 T_2}{T_1} = \frac{617\ cm^3 \times 273\ K}{282\ K} = \mathbf{597.3\ cm^3}$$

Check: The decrease in temperature decreases the volume. So, the answer is reasonable.