Question #33693

A balloon can hold 1000 cc of air before bursting. It contains 975 cc of air at 5 degree centigrade. Will it burst when it is taken into a house at 25 degree centigrade? Assume that the pressure of the gas remains constant in balloon.

Solution:

According to Charles's law $\frac{V_1}{T_1} = \frac{V_2}{T_2}$ at a constant pressure. So, if $V_1 = 975\ cc$, $T_1 = 5℃ = 278\ K$ and $T_2 = 25℃ = 298\ K$, $V_2 = \frac{V_1 \cdot T_2}{T_1} = \frac{975 \cdot 298}{278} = 1045\ cc$.

Answer: A balloon will burst.