

the volume of gas filled balloon is 30 L at 313k and 153 kPa. What would the volume be at standard temperature and pressure?

Solution:

The standard condition for temperature and pressure are: 273 K and 100 kPa, respectively.

We'll use following equation for calculate the volume at standard condition:

$$V_0 = \frac{PV T_0}{TP_0} = \frac{153 \cdot 30 \cdot 273}{313 \cdot 100} = 40.03\text{L}$$

Answer: $V_0=40.03\text{ L}$.