Question:

A balloon filled to 2.00 L at 98.0 kPa is taken to an altitude, at which the pressure is 82.0 kPa, the temperature remaining the same. What is the new volume of the balloon?

Answer:

Boyle's law: the equation states that product of pressure and volume is a constant for a given mass of confined gas as long as the temperature is constant. For comparing the same substance under two different sets of condition, the law can be usefully expressed as:

$$P_1 V_1 = P_2 V_2.$$

So in our case, new volume of the balloon is

V_2 = 98.0·2.00/82.0 = **2.39 L**