Answer on Question #4302 - Chemistry - Physical Chemistry

Question:

A gas at a temperature of 105 degrees C occupies a volume of 205 mL. Assuming constant pressure, determine the volume at 25 degrees C.

Answer:

Accordinc tyo Charles law (law of the volumes), if pressure remains constant the volume is directly proportional to its temperature

$V_1/T_1 = V_2/T_2$

$T_1 = 105\ ^0C + 273\ K = 378\ K$

$T_2 = 25\ ^0C + 273\ K = 298\ K$

The unknown volume can be calculated as follows:

$V_2 = (V_1 * T_2)/T_1 = (205\ mL * 298\ K) / 378\ K = 162\ ml$