Answer on Question #42740, Physics, Molecular Physics — Thermodynamics

During an experiment an ideal gas is found to obey an additional law $PV^2 = constant$.The gas is initially at temperature T and volume V,when it expands to volume 2V,the resulting temperature is (1) $T/2$ (2) $2T$ (3) $2^{1/2}T$ (4) $T/2^{1/2}$

Solution

For any ideal gas we have

$$\frac{pV}{T} = const$$

From $pV^2 = const$ we can conlude that

$$TV = const$$

Hence, when new volume will be $2V$, new temperature will be $T/2$