## Question \#46808, Chemistry, Inorganic Chemistry

If 3.0 L of oxygen gas at is cooled at constant pressure until the volume becomes 1.50 L , then what is the final temperature?

## Answer:

To solve this problem you need to use Charles law equations $V_{1} / T_{1}=V_{2} / T_{2}$.

Because initial conditions are not specified, then we take the standard ambient temperature and pressure (SATP).
$\mathrm{T}_{1}=25^{\circ} \mathrm{C}=298 \mathrm{~K}$
$\mathrm{V}_{1}=3.0 \mathrm{~L}$
$\mathrm{V}_{2}=1.5 \mathrm{~L}$
$\mathrm{T}_{2}=$ ?

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\begin{gathered}
\mathrm{V}_{1} / \mathrm{T}_{1}=\mathrm{V}_{2} / \mathrm{T}_{2} \\
\mathrm{~T}_{2}=(\mathrm{T} 1 * \mathrm{~V} 2) / \mathrm{V}_{1} \\
\mathrm{~T}_{2}=(298 * 1.5) / 3=149(\mathrm{~K})
\end{gathered}
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