7 A sample of pure $\mathrm{Mg}\left(\mathrm{NO}_{3}\right)_{2}$ was decomposed by heating as shown in the equation below.

$$
2 \mathrm{Mg}\left(\mathrm{NO}_{3}\right)_{2}(\mathrm{~s}) \longrightarrow 2 \mathrm{MgO}(\mathrm{~s})+4 \mathrm{NO}_{2}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g})
$$

| $\mathbf{0}$ | $\mathbf{7}$. | $\mathbf{1} \mathrm{A} 3.74 \times 10^{-2} \mathrm{~g}$ sample of $\mathrm{Mg}\left(\mathrm{NO}_{3}\right)_{2}$ was completely decomposed by heating. |
| :--- | :--- | :--- |

Calculate the total volume, in $\mathrm{cm}^{3}$, of gas produced at $60.0^{\circ} \mathrm{C}$ and 100 kPa . Give your answer to the appropriate number of significant figures. The gas constant $R=8.31 \mathrm{~J} \mathrm{~K}^{-1} \mathrm{~mol}^{-1}$.

Total volume of gas = $\qquad$ $\mathrm{cm}^{3}$

| $\mathbf{0}$ | $\mathbf{7}$ | $\mathbf{2}$ The mass of MgO obtained in this experiment is slightly less than that expected from |
| :--- | :--- | :--- | :--- | the mass of $\mathrm{Mg}\left(\mathrm{NO}_{3}\right)_{2}$ used. Suggest one practical reason for this.

$\qquad$
$\qquad$
$\qquad$

