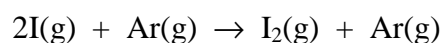


Marks
4

- The following data were obtained for the reaction of iodine atoms in the gas phase in the presence of argon.



Experiment Number	Initial [I] (M)	Initial [Ar] (M)	Initial Reaction Rate $-\text{d}[\text{I}(\text{g})]/\text{dt}$ (M s^{-1})
1	1.0×10^{-5}	1.0×10^{-3}	8.70×10^{-4}
2	2.0×10^{-5}	1.0×10^{-3}	3.48×10^{-3}
3	2.0×10^{-5}	5.0×10^{-3}	1.74×10^{-2}

Derive an expression for the rate law for the formation of $\text{I}_2(\text{g})$ and calculate the value of the rate constant for this reaction.

Rate law:

Rate constant:

Calculate the rate of appearance of $\text{I}_2(\text{g})$ when $[\text{I}(\text{g})] = 1.0 \times 10^{-3} \text{ M}$ and $[\text{Ar}(\text{g})] = 1.0 \times 10^{-2} \text{ M}$.

Answer: