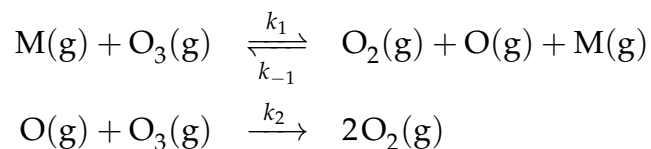


Name: _____ Entry No.: _____

1. The decomposition of ozone $2\text{O}_3 \rightarrow 3 \text{O}_2(\text{g})$ occurs by the reaction mechanism



where M is a molecule that can exchange energy with the reacting ozone molecule through a collision, but does not react.

- Use this mechanism to derive the rate law for $d[\text{O}_3]/dt$.
- Explain why either (i) $v_{-1} \gg v_2$ and $v_{-1} \gg v_1$ or (ii) $v_2 \gg v_{-1}$ and $v_2 \gg v_1$ must be true for the SSA to apply.
- The rate law for the decomposition reaction is found to be $d[\text{O}_3]/dt = -k[\text{O}_3][\text{M}]$. Is this rate law consistent with the conditions given by either (i) or (ii) or both in the previous question?