

11.S: Chemical Kinetics I (Summary)

The results of the integration of these simple rate laws can be summarized in the following table.

| Order | Elementary Reaction | Integrated rate law | Linear plot |
|-------|-----------------------|--|---|
| 0 | - | $[A] = [A]_o - kt$ | $[A]$ vs. t |
| 1 | $A \rightarrow P$ | $\ln[A] = \ln[A]_o - kt$ $[A] = [A]_o e^{-kt}$ | $\ln[A]$ vs. t |
| 2 | $A + A \rightarrow P$ | $\frac{1}{[A]} = \frac{1}{[A]_o} + kt$ | $\frac{1}{[A]}$ vs. t |
| | $A + B \rightarrow P$ | $\frac{1}{[B]_0 - [A]_0} \ln\left(\frac{[B][A]_o}{[A][B]_o}\right) = kt$ | $\ln\left(\frac{[B]}{[A]}\right)$ vs. t |

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