Constants and formulas

$R = 8.315\,J\,K^{-1}\,mol^{-1}$; $1\,atm = 101325Pa$; $N_A = 6.022 \times 10^{23}$

Half-life, $t_{1/2}$: time at which $[A] = [A]_0/2$

Integrated rate laws.

$[A] = [A]_0 - kt$; $[A] = [A]_0\,e^{-kt}$; $1/[A] = 1/[A]_0 + 2kt$

$\ln\left(\frac{[B][A]_0}{[B]_0[A]}\right) = ([B]_0 - [A]_0)kt$

$A \to I \to P$: $P = \left(1 - \frac{k_1 e^{-k_2 t} - k_2 e^{-k_1 t}}{k_1 - k_2}\right)[A]_0$

$A \leftrightharpoons P$: $[A] = [A]_0\,\frac{k_r + k_f e^{-kt}}{k}$

T-jump experiment: $x = [A] - [A]_{eq,2} = x_0 \exp(-(k_{f2} + k_{r2})t)$

Temperature dependence of rate constants.

$k = Ae^{-E_a/RT}$; $k = \frac{k_B T}{h}\,\exp(-\Delta G_0^{\ddagger}/k_B T)$