BIO134, Chemical Kinetics

Additional Question for Workshop 2

Consider a reaction $RCH{=}CH_2 + I_2 \rightarrow RCHICH_2I$. The dependence of the rate on $[I_2]$ can be studied if a large excess of $RCH{=}CH_2$ is used. The data below have been recorded at 298 K.

Time / s	0	1000	2000	3000	4000	5000	6000	7000	8000
$[I_2]$ / mol dm^{-3}	0.02	0.0156	0.0128	0.0109	0.0094	0.0083	0.0075	0.0068	0.0062

(a) Plot $[I_2]$ against time.

(b) Read on the graph the half-lives at several starting concentrations.

(c) Plot $\ln [I_2]$ or $1/[I_2]$ and determine the order with respect to $[I_2]$.

(d) Determine the rate constant.