(35) Chemical Kinetics

27/9/16

For the reaction $2A + B \rightarrow A_2B$ Rate $= k[A][B]^2$ with $k = 2 \times 10^{-6}\ mol^{-2}\ l^2\ s^{-1}$. calculate the initial rate of the reaction when $[A] = 0.1\ mol\ l^{-1}$ and $[B] = 0.2\ mol\ l^{-1}$. calculate the rate of reaction after $[A]$ is reduced to $0.06\ mol\ l^{-1}$? [$8 \times 10^{-9}\ mol\ l^{-1}\ s^{-1}$, $3.89 \times 10^{-9}\ mol\ l^{-1}\ s^{-1}$]

⇒ calculate the half life of a first order reaction from these rate constants given below: a) $2\ s^{-1}$ b) $2\ min^{-1}$ c) $4\ years^{-1}$

The half-life for the radioactive decay of C-14 is 5730 years. An archaeological artifact was found that had only 80% of the C-14 found in living tissue. Calculate the age of the sample? [1845 years]

A first order reaction takes 40 minutes for 30% decomposition. Calculate $t_{1/2}$ [77.7 min]

Consider a reaction $A \rightarrow$ Products with $k = 2 \times 10^{-2}\ s^{-1}$. Calculate the concentration of A remaining after 100s if the initial concentration of A is $1.0\ mol\ l^{-1}$? [$0.1354\ mol\ l^{-1}$]

Sucrose decomposes in acid solution into glucose and fructose according to the first order rate law with $t_{1/2} = 3.00$ hours. What fraction of the sample of sucrose remains after 8 hours? [0.158]

A first order reaction has a rate constant $1.15 \times 10^{-3}\ s^{-1}$. How long will 5g of this reactant take to reduce to 3g? [444s]

$t_{1/2}$ of a first order reaction is the time taken for one-half of its initial amount is