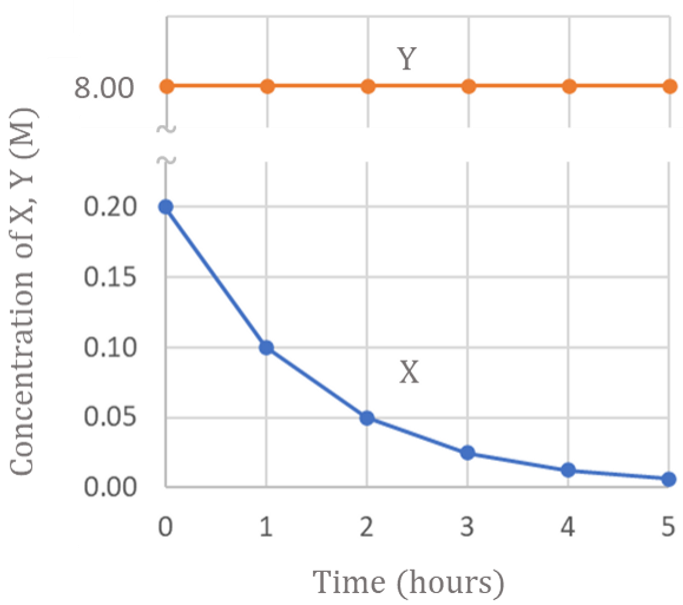
Half Life

Example One

From the graph below determine the order of the reaction with respect to [X] and [Y]



Example Two

Under acidic conditions, sucrose, $C_{12}H_{22}O_{11}$, can undergo a decomposition reaction to generate fructose and glucose. The rate law for this reaction is shown below:

Rate $= k\,[C_{12}H_{22}O_{11}]$

What is the half-life of $C_{12}H_{22}O_{11}$ if the rate constant was found to be $k = 0.240\ h^{-1}$?

Example Three

A radioactive isotope of iodine (Iodine-131) is often used in medicine to treat thyroid diseases. The half-life of iodine-131 is 8.0 days. If 180 grams of I-131 are shipped to a hospital, how much of this isotope would remain after 24 days has elapsed?

Example Four

The decomposition of hydrogen iodide follows second order kinetics with a rate constant of k=28.0 $M^{-1}s^{-1}$ exhibits second-order kinetics at 430 K. If a reaction starts with an initial concentration of HI equal to 2.00 x 10^{-2} M, determine the half-life of HI?

$2HI \rightarrow H_2 + I_2$

Example Five

An isotope of lead (Pb-217) has a half-life of 20.0 seconds. What percentage of this isotope would remain after 55.0 seconds?