

TABLE 12.6: Summary of the Kinetics for Reactions of the Type $aA \rightarrow$ Products That Are Zero, First, or Second Order in $[A]$

	Zeroth Order	First Order	Second Order
Rate Law:	Rate = k	Rate = $k[A]$	Rate = $k[A]^2$
Integrated Rate Law:	$[A] = -kt + [A]_0$	$\ln[A] = -kt + \ln[A]_0$	$1/[A] = kt + 1/[A]_0$
Plot Needed to Give a Straight Line:	$[A]$ versus t	$\ln[A]$ versus t	$1/[A]$ versus t
Relationship of Rate Constant to the Slope of Straight Line:	Slope = $-k$	Slope = $-k$	Slope = k
Half-Life:	$t_{1/2} = [A]_0/2k$	$t_{1/2} = 0.693/k$	$t_{1/2} = 1/k[A]_0$