$$t_{1/2} = \frac{[A]_0 - [A]_{0/2}}{K}$$

$$\boxed{t_{1/2} = \frac{[A]_0}{2k}}$$

First order

$$K = \frac{2.303}{t} \log \frac{[A]_0}{[k]_{0/2}}$$

$$t_{1/2} = \frac{2.303}{K} \log 2$$

$$\boxed{t_{1/2} = \frac{0.693}{K}}$$

The temperature dependence of the Reactants

Temperature coefficient

The ration b/w the rate constant of a reaction at two temperatures differing by 10°C is called temperature coefficient of the reaction.

The relation b/w rate constant temperature has been suggested by Arhenium and it is called Arhenius Equation.

$$\text{Equation : } K = Ae^{Ea/RT}$$

R- universal gas constant

T- Temperature

K - Rate constant.

Ea - Activation energy