

10. Dependence of reaction rate on temperature.

A general approximate rule or the effect of temperature on reaction rates is that the rate of a reaction becomes almost double for every $10^{\circ}C$ rise in temperature. This is also called temperature coefficient.

Temperature coefficient. Temperature coefficient of a reaction is defined as the ratio of rate constants at two temperatures differing by (generally $25^{\circ}C$ and $35^{\circ}C$) $10^{\circ}C$.

$$\text{Temperature coefficient} = \frac{k \text{ at } (t + 10^{\circ}C)}{k \text{ at } t^{\circ}C} = \frac{k_{35^{\circ}C}}{k_{25^{\circ}C}} \quad \text{Or} \quad \text{Temperature coefficient} = \frac{k_{t+10}}{k_t}$$

The temperature coefficient for most of the reactions lies between 2 and 3 *i.e.* the rate of reaction increase by a factor of 2 to 3, for every $10^{\circ}C$ rise in temperature.