

Board – CBSE

Class – 12th

Topic – Chemical Kinetics

1. The rate of the chemical reaction doubles for an increase of 10 K in absolute temperature from 298 K. Calculate E_a .
2. The activation energy for the reaction $2\text{HI}(\text{g}) \rightarrow \text{H}_2 + \text{I}_2(\text{g})$ is 209.5 kJmol^{-1} at 581K. Calculate the fraction of molecules of reactants having energy equal to or greater than activation energy?
3. The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature.
4. Consider a certain reaction $\text{A} \rightarrow \text{Products}$ with $k = 2.0 \times 10^{-2} \text{ s}^{-1}$. Calculate the concentration of A remaining after 100 s if the initial concentration of A is 1.0 molL^{-1} .
5. A first order reaction takes 40 min for 30% decomposition. Calculate $t_{1/2}$.
6. The rate constant for a first order reaction is 60 s^{-1} . How much time will it take to reduce the initial concentration of the reactant to its $1/16^{\text{th}}$ value?
7. Calculate the half-life of a first order reaction from their rate constants given below:
(a) 200 s^{-1} (b) 2 min^{-1}
8. A reaction is second order with respect to a reactant. How is the rate of reaction affected if the concentration of the reactant is (i) doubled (ii) reduced to half?
9. For the reaction $\text{R} \rightarrow \text{P}$, the concentration of a reactant changes from 0.03 M to 0.02 M in 25 minutes. Calculate the average rate of reaction using units of time both in minutes and P seconds.
10. Plot a graph showing variation of potential energy with reaction coordinate?
11. Write Arrhenius equation.
12. For the reaction $\text{A} + \text{B} \rightarrow \text{C} + \text{D}$, the rate of reaction doubles when the concentration of A doubles, provided the concentration of B is constant. To what order does A enter into the rate expression?
13. Differentiate between order and molecularity of a reaction?
14. What are the units of a rate constant of a
a) First order reaction b) n^{th} order reaction.
15. What is instantaneous rate of a reaction? How is it determined?
16. Write the integrated rate equation for –
a) zero order reaction. b) first order reaction.