



ASSIGNMENT NO. 4

SUBJECT: CHEMISTRY

CLASS-XII

OCTOBER, 2025

Chapter: 3 Chemical kinetics

1. Identify the reaction order from the following rate constant, $k = 2.3 \times 10^{-5} \text{ L mol}^{-1} \text{ s}^{-1}$.
2. Why does the rate of reaction not remain constant throughout the reaction process?
3. The rate constant for a zero order reaction in A is $0.0030 \text{ mol}^{-1} \text{ s}^{-1}$. How long will it take for the initial concentration of A to fall from 0.10 M to 0.075 M?
4. A reaction has half-life of 10 min.
 - (i) calculate the rate constant for the first order reaction.
 - (ii) what fraction of reactant will be left after an hour of the reaction?
5. Why rate of reaction increase by increasing temperature?
6. The rate of a particular reaction quadruples when the temperature changes from 293K to 313K. Calculate activation energy.
7. If the decomposition of nitrogen oxide as
$$2\text{N}_2\text{O}_5 \longrightarrow 4\text{NO}_2 + \text{O}_2$$
follows a first order kinetics.
 - (i) Calculate the rate constant for a 0.05 M solution if the instantaneous rate is $1.5 \times 10^{-6} \text{ mol/l/s}$?
 - (ii) What concentration of N_2O_6 would give a rate of $2.45 \times 10^{-5} \text{ mol L}^{-1} \text{ s}^{-1}$ Rate = $2.45 \times 10^{-5} \text{ mol L}^{-1} \text{ s}^{-1}$
8. Write the difference between order and molecularity of reaction.
9. Draw a schematic graph showing how the rate of a first order reaction changes in concentration of reactants.
10. Identify the reaction order from the following rate constant, $k = 2.3 \times 10^{-5} \text{ L mol}^{-1} \text{ s}^{-1}$.
11. Why does the rate of reaction not remain constant throughout the reaction process?
12. The rate constant for a zero order reaction in A is $0.0030 \text{ mol}^{-1} \text{ s}^{-1}$. How long will it take for the initial concentration of A to fall from 0.10 M to 0.075 M?
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