

Chemical Kinetics

1. ____ of a reaction cannot be determined experimentally. (M-2004)
 1) Order 2) Rate 3) Rate constant 4) Molecularity
2. For $\text{H}_2 + \text{Cl}_2 \xrightarrow{\text{X}} 2 \text{HCl}$, rate law is given by $R=K$. Then, X is (AIIMS 02)
 1) Pt 2) Ni 3) h ν 4) Water
3. If both rate ($\frac{dc}{dt}$) & specific rate (k) have same units, then rate law is [PMT 2003]
 1) $R=K [A]^2$ 2) $R=K[A]^{1/2}$ 3) $R=K [A]^{-2}$ 4) $R=K$
Hint: for zero order both rate & specific rate have same units.
4. For $A+B \rightarrow C+D$, when [A] alone is doubled, rate gets doubled. But, when [B] alone is increased by 9 times, rate gets tripled. Then, order of reaction is [Karnataka - 2003]
 1) 3/4 2) 3/2 3) 4/9 4) 2
5. Rate law for $2A+BC+D$ from following data [Kerala CET 2004]
- | S.No | [A] (M) | [B] (M) | Rate (M/s) |
|------|---------|---------|------------|
| 1 | 0.01 | 0.01 | 2.5 |
| 2 | 0.01 | 0.02 | 5 |
| 3 | 0.03 | 0.02 | 45 |
- 1) $r=K[A]^{1/3}[B]$ 2) $r=K[A]^2[B]$ 3) $r=K[A][B]^{1/3}$ 4) $r=K[a]^{2/3} [B]^{1/3}$
6. Which of the following relation is correct for a first order reaction? (k = rate constant; r = rate of reaction; c = conc. of reactant) (M- 2004)
 1) $k = r \times c^2$ 2) $k = r \times c$ 3) $k = r / c$ 4) $k = c / r$
7. $\frac{dc}{dt}$ of a first order reaction depends on [AFMC 2003]
 1) Time 2) Concentration 3) Temperature 4) All
8. Which of the following is correct for a first order reaction?

(K= rate constant $t_{1/2}$ = half-life)

(E- 2001)

- 1) $t_{1/2} = 0.693K$ 2) $k.t_{1/2} = \frac{1}{0.693}$ 3) $k.t_{1/2} = 0.693$ 4) $6.93 k t_{1/2} = 1$

9. $\text{RCOOR} + \text{H}_2\text{O} \xrightarrow{\text{HCl}} \text{RCOOH} + \text{ROH}$ is an example for

[Karnataka-2001]

- 1) 2nd order 2) Unimolecular 3) Pseudo Unimolecular 4) Zero Order

10. Order of a reaction is decided by

[KCET 2002]

- 1) Molecularity 2) Law of Mass Action
3) Performing experiment 4) Le chatelier principle

11. $2\text{A} \rightarrow \text{B} + \text{C}$ would be a zero order reaction when rate of reaction (CBSE 2002)

- 1) Is directly proportional [A]
2) Is directly proportional $[\text{A}]^2$
3) Is independent of [A]
4) Is independent of [B] & [C]

12). The time taken for the completion of 90% of a first order reaction is 't' min.

What is the time (in sec) taken for the completion of 99% of the reaction?

(M-2005)

- 1) 2t 2) $t / 30$ 3) 120t 4) 60t

13) $\text{A (g)} \rightarrow \text{B (g)}$ is a first order reaction. The initial concentration of A is 0.2 mol lit^{-1} after 10 minutes the concentration of B is found to be 0.18 mol. lit^{-1} The rate constant (in min^{-1}) for the reaction is

[M - 2008]

- 1) 0.2303 2) 2.303 3) 0.693 4) 0.01

14) Consider the following statements.

[PmT2010]

- i) Increase in concentration of reactant increases the rate of zero order reaction.
ii) Rate constant 'k' is equal to collision frequency, A if $E_a = 0$.
iii) Rate constant 'k' is equal to collision frequency, A if $E_a = \infty$.
iv) $\log k$ vs $1/T$ is a straight line.

Correct statements are

- 1) i & iv 2) ii & iv 3) iii & iv 4) ii & iii.

15) Which of the following statements for the order of a reaction is incorrect?

[CBSE (2011)]

- 1) Order of a reaction is always a whole number.
- 2) Order can be determined only experimentally.
- 3) Order is not influenced by stoichiometric coefficient of the reactants.
- 4) Order of a reaction is sum of power to the concentration terms in rate equation.

Key

1) 4 2) 3 3) 4 4) 2 5) 2 6) 4 7) 4 8) 3 9) 3 10) 3 11) 3 12) 3 13) 1

14) 2 15) 1