DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : CHEMISTRY**
Date : **DPP No. : 8**

Topic :- Chemical Kinetics

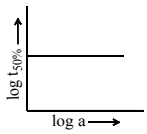
1. In a second order reaction when the concentration of both reactant are equal, the reaction is completed in 500 s. How long will it take for the reaction to go to 60% completion?
   a) 1000 s b) 300 s c) 3000 s d) 2000 s

2. The rate constant (K) for the reaction $2A + B \longrightarrow$ Product was found to be 2.5×10^{-5} litre mol^{-1} sec^{-1} after 15 sec, 2.60×10^{-5} litre $mol^{-1} sec^{-1}$ after 30 sec and 2.55×10^{-5} litre mol^{-1} sec^{-1} after 50 sec. The order of reaction is:
   a) 2 b) 3 c) Zero d) 1

3. The differential rate expression for the reaction $H_2 + I_2 \longrightarrow 2HI$ is:
   a) $\frac{-d[H_2]}{dt} = \frac{-d[I_2]}{dt} = \frac{-d[HI]}{dt}$
   b) $\frac{d[H_2]}{dt} = \frac{d[I_2]}{dt} = \frac{d[HI]}{dt}$
   c) $\frac{1}{2}\frac{d[H_2]}{dt} = \frac{1}{2}\frac{d[I_2]}{dt} = \frac{d[HI]}{dt}$
   d) $-2\frac{d[H_2]}{dt} = -2\frac{d[I_2]}{dt} = \frac{d[HI]}{dt}$

4. For the elementary step,
   $(CH_3)_3 \cdot CBr(aq) \longrightarrow (CH_3)_3C^+(aq) + Br^-(aq)$ the molecularity is:
   a) Zero b) 1 c) 2 d) Cannot ascertained

5. A graph plotted between log $t_{50\%} vs. \log a$ concentration is a straight line. What conclusion can you draw from the given graph?



   a) $n = 1, t_{1/2} = \frac{1}{K \cdot a}$ b) $n = 2, t_{1/2} = 1/a$ c) $n = 1, t_{1/2} = \frac{0.693}{K}$ d) None of the above

6. If a is the initial concentration then time required to decompose half of the substance for nth order is inversely proportional to:

a) a^n b) a^{n-1} c) a^{1-n} d) a^{n-2}

7. The hydrolysis of ethyl acetate,
$CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$ is:
a) First order b) Second order c) Third order d) Zero order

8. The rate law for a reaction between the substances A and B is given by rate $= k[A]^n[B]^m$. On doubling the concentration of A and halving the concentration of B, the ratio of the new rate to the earlier rate of the reaction will be as
a) $\frac{1}{2^{m+n}}$ b) $(m+n)$ c) $(n-m)$ d) $2^{(n-m)}$

9. For the reaction
$H_2(g) + Br_2(g) \rightarrow 2HBr(g)$
The experimental data suggest
rate $= k[H_2][Br_2]^{1/2}$
the molecularity and order of the reaction are respectively
a) $1, \frac{1}{2}$ b) 1, 1 c) $\frac{3}{2}, \frac{3}{2}$ d) $2, \frac{3}{2}$

10. The rate of reaction increases with temperature due to
a) Decrease in activation energy b) Increase in activation energy
c) Increase in collision frequency d) Increase in concentration

11. In a first order reaction, the concentration of the reactant is decreased from 1.0 M to 0.25 M in 20 minute. The rate constant of the reaction would be:
a) 10 min^{-1} b) 6.931 min^{-1} c) 0.6931 min^{-1} d) 0.06931 min^{-1}

12. The reaction obey I order with respect to H_2 and ICl both
$H_2(g) + 2ICl(g) \longrightarrow 2HCl(g) + I_2(g)$
Which of the following mechanism is in consistent with the given fact?
Mechanism A: $H_2(g) + 2ICl \longrightarrow 2HCl(g) + I_2(g)$
Mechanism B: (i) $H_2(g) + ICl(g) \xrightarrow{slow} HCl(g) + HI(g)$
(ii) $HI(g) + ICl(g) \longrightarrow HCl(g) + I_2$
a) A and B both b) Neither A nor B c) A only d) B only

13. Two reactions $A \longrightarrow$ products and $B \longrightarrow$ products have rate constants K_A and K_B at temperature T and activation energies E_A and E_B respectively. If $K_A > K_B$ and $E_A < E_B$ and assuming that A for both the reactions is same, then:
a) At higher temperatures K_A will be greater than K_B
b) At lower temperature K_A and K_B will differ more and $K_A > K_B$
c) As temperature rises K_A and K_B will be close to each other in magnitude
d) All of the above

14. The half life for a reaction ... of temperature.
    a) Independent
    b) Increased with increase
    c) Decreased with increase
    d) Dependent

15. The following mechanism has been proposed for the reaction of NO with Br_2 to form NOBr
    $NO(g) + Br_2(g) \rightleftharpoons NOBr_2(g)$
    $NOBr_2(g) + NO(g) \rightarrow 2NOBr(g)$
    If the second step is the rate determining step, the order of the reaction with respect to NO(g) is
    a) 1 b) 0 c) 3 d) 2

16. The unit and value of rate constant and that of rate of reaction are same for
    a) Zero order b) First order c) Second order d) Third order

17. According to collision theory of reaction rates:
    a) Every collision between reactants leads to chemical reaction
    b) Rate of reaction is proportional to velocity of molecules
    c) All reactions which occur in gaseous phase are zero order reactions
    d) Rate of reaction is directly proportional to collision frequency

18. Half-life of a reaction is found to be inversely proportional to the cube of initial concentration. The order of reaction is
    a) 4 b) 3 c) 5 d) 2

19. A reaction involving two different reactants can never be
    a) Bimolecular reaction b) Second order reaction
    c) First order reaction d) Unimolecular reaction

20. For the non-equilibrium process, $A + B \longrightarrow$ Products, the rate is first order with respect to A and second order respect to B. If 1.0 mole each of A and B are introduced into a 1 litre vessel and the initial rate was 1.0×10^{-2} mol/litre-sec. The rate (in mol $litre^{-1} sec^{-1}$) when half of the reactants have been used:
    a) 1.2×10^{-3} b) 1.2×10^{-2} c) 2.5×10^{-4} d) None of these