DPP
DAILY PRACTICE PRODUCTS

Class : XIIth | **Subject : CHEMISTRY**

Date : | **DPP No. : 1**

Topic :- Chemical Kinetics

1. The number of molecules of the reactants taking part in a single step of the reaction tells about:
   a) Molecularity of the reaction
   b) Mechanism of the reaction
   c) Order of reaction
   d) All of the above

2. For the reaction system,
   $2NO(g) + O_2(g) \rightarrow 2NO_2(g)$
   Volume is suddenly reduced to half its value by increasing the pressure on it. If the reaction is of first order with respect to O_2 and second order with respect to NO; the rate of reaction will
   a) Diminish to one –fourth of its initial value
   b) Diminish to one –eighth of its initial value
   c) Increase to eight time of its initial value
   d) Increase to four time of its initial value

3. The reaction,
   $CH_3COOC_2H_5 + NaOH \longrightarrow CH_3COONa + C_2H_5OH$ is :
   a) Biomolecular reaction
   b) II order reaction
   c) Both (a) and (b)
   d) None of these

4. Which is correct relation in between $\frac{dc}{dt}, \frac{dn}{dt}$ and $\frac{dP}{dt}$, where c, n, and P, represent concentration, mole and pressure terms for gaseous phase reactant A(g)$\longrightarrow$ product?
   a) $-\frac{dc}{dt} = -\frac{1}{V}\frac{dn}{dt} = -\frac{}{R}$
   b) $\frac{dc}{dt} = \frac{dn}{dt} = -\frac{dP}{dt}$
   c) $\frac{dc}{dt} = \frac{RT}{V}\frac{dn}{dt} = -\frac{dP}{dt}$
   d) All of the above

5. The rate constant of a reaction is found to be $3 \times 10^{-3} mol\ L^{-1} \min^{-1}$. The order of reaction is
   a) Zero
   b) 1
   c) 2
   d) 1.5

6. A reactant (A) forms two products :
   $A \xrightarrow{k_2} B$, Activation energy E_{a_1}
   $A \xrightarrow{k_2} C$, Activation energy E_{a_2}
   If $E_{a_2} = 2\ E_{a_1}$, than k_1 and k_2 are related as

a) $k_1 = 2k_2 e_{E_{a_2}}/RT$ b) $k_1 = k_2 e_{E_{a_1}}/RT$ c) $k_2 = k_1 e_{E_{a_2}}/RT$ d) $k_1 = Ak_2 e_{E_{a_1}}/RT$

7. For the reaction $2A + B \rightarrow A_2B$, the rate Law given is
a) k[2A][B] b) $k[A]^3[B]$ c) $k[A][B]^3$ d) $k[A]^2[B]$

8. For producing the effective collisions the colliding molecules must have:
a) A certain minimum amount of energy
b) Energy lesser than threshold energy
c) Improper orientation
d) Proper orientation and energy equal or greater than threshold energy

9. The chemical reaction $2O_3 \rightarrow 3O_2$ proceeds as follows
$O_3 \rightleftharpoons O_2 + O$ (fast)
$O + O_3 \rightarrow 2O_2$ (slow)
The rate law expression should be
a) $r = k[O_3]^2$ b) $r = k[O_3]^2\,[O_2]^{-1}$ c) $r = k[O_3][O_2]$ d) Unpredictable

10. Two substances A and B are present such that $[A] = 4[B]$ and half-life of A is 5 minute and of B is 15 minute. If they start decaying at the same time following first order, how much time later will the concentration of both of them would be same?
a) 15 minute b) 10 minute c) 5 minute d) 12 minute

11. A reaction involving A, B and C as reactants is found to obey the rate law, rate=$k[A]^x[B]^y[C]^z$. When the concentration of A, B and C are doubled separately, the rate is also found to increase two, zero and four times respectively. The overall order of the reaction is
a) 1 b) 2 c) 3 d) 4

12. The rate constant of nth order has units:
a) $\text{litre}^{1-n}\text{mol}^{1-n}\,\text{sec}^{-1}$ b) $\text{mol}^{n-1}\ \text{litre}^{n-1}\,\text{sec}^{-1}$ c) $\text{mol}^{1-n}\ \text{litre}^{n-1}\,\text{sec}^{-1}$ d) None of these

13. The reaction; N_2O_5 in $2NO_2 + 1/2\ O_2(g)$ is of first order for N_2O_5 with rate constant $6.2 \times 10^{-4} s^{-1}$. What is the value of rate of reaction when $[N_2O_5] = 1.25$ mole L^{-1}?
a) 5.15×10^{-5} mole $L^{-1}s^{-1}$
b) 6.35×10^{-3} mole $L^{-1}s^{-1}$
c) 7.75×10^{-4} mole $L^{-1}s^{-1}$
d) 3.85×10^{-4} mole $L^{-1}s^{-1}$

14. $t_{1/4}$ can be taken as the time taken for the concentration of reactant to drop to $\frac{3}{4}$ of its initial value. If the rate constant for a first order reaction is k the$t_{1/4}$ can be written as
a) 0.75 /k b) 0.69 /k c) 0.29 /k d) 0.10 /k

15. In a chemical reaction two reactants take part. The rate of reaction is directly proportion to the

concentration of one of them and inversely proportional to the concentration of the other. The order of reaction is

a) 0 b) 1 c) 2 d) 4

16. Which of the following is not the example of pseudo unimolecular reaction?

a) $CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$

b) $C_{12}H_{22}O_{11} + H_2O \xrightarrow{H^+} C_6H_{12}O_6 + C_6H_{12}O_6$
Glucose fructose

c) $CH_3COCl + H_2O \rightarrow CH_3COOH + HCl$

d) $CH_3COOC_2H_5 + H_2O \xrightarrow{OH^-} CH_3COOH + C_2H_5OH$

17. The differential rate law for the reaction,
$4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$

a) $-\frac{d[NH_3]}{dt} = -\frac{d[O_2]}{dt} = -\frac{d[NO]}{dt} = -\frac{d[H_2O]}{dt}$

b) $\frac{d[NH_3]}{dt} = \frac{d[O_2]}{dt} = -\frac{1}{4}\frac{d[NO]}{dt} = -\frac{1}{6}\frac{d[H_2O]}{dt}$

c) $\frac{1}{4}\frac{d[NH_3]}{dt} = \frac{1}{5}\frac{d[O_2]}{dt} = \frac{1}{4}\frac{d[NO]}{dt} = \frac{1}{6}\frac{d[H_2O]}{dt}$

d) $-\frac{1}{4}\frac{d[NH_3]}{dt} = -\frac{1}{5}\frac{d[O_2]}{dt} = \frac{1}{4}\frac{d[NO]}{dt} = \frac{1}{6}\frac{d[H_2O]}{dt}$

18. 1 g of ${}_{79}Au^{198}$ $(t_{1/2} = 65\text{ h})$ give stable mercury by β- emission. What amount of mercury will left after 260 h?

a) 0.9375 g b) 0.3758 g c) 0.7586 g d) 0.9000 g

19. The rate law for the chemical reaction
$2NO_2CL \rightarrow 2NO_2 + CL_2$ is rate =k[NO_2Cl].The rate determining step is

a) $2NO_2Cl \rightarrow 2NO_2 + 2Cl$

b) $NO_2 + Cl_2 \rightarrow NO_2Cl + Cl$

c) $NO_2Cl + Cl \rightarrow NO_2 + Cl_2$

d) $NO_2Cl \rightarrow NO_2 + Cl$

20. The rate law for the reaction
$R\text{Cl} + \text{NaOH} \rightarrow R\text{OH} + \text{NaCl}$ is given by Rate $= k[R\text{Cl}]$. The rate of this reaction

a) Is doubled by doubling the concentration of NaOH

b) Is halved by reducing the concentration of RCl by one half

c) Is increased by increasing the temperature of the reaction

d) In unaffected by change in temperature