LAKSHYA (JEE)

Chemical kinetics

1. For the reaction $2A \rightarrow B + 3C$; if $-\dfrac{d[A]}{dt}$

   $= k_1[A]^2 ; \dfrac{d[B]}{dt} = k_2[A]^2 ; \dfrac{d[C]}{dt} = k_3[A]^2$

   the correct reaction between k_1, k_2 and k_3 is
   (A) $k_1 = k_2 = k_3$
   (B) $2k_1 = k_2 = 3k_2$
   (C) $4k_1 = k_2 = 3k_2$
   (D) $\dfrac{k_1}{2} = k_2 = \dfrac{k_3}{3}$

2. The rate constant of nth order has units:
   (A) $litre^{1-n} \, mol^{1-n} \, sec^{-1}$
   (B) $Mol^{1-n} \, litre^{1-n} \, sec$
   (C) $Mol^{1-n2} \, litre^{n2} \, sec^{-1}$
   (D) $Mole^{1-n} \, litre^{n-1} \, sec^{-1}$

3. Which of the following statement is incorrect?
   (A) Unit of rate of disappearance is Ms^{-1}
   (B) Unit of rate of reaction is Ms^{-1}
   (C) Unit of rate constant k depends upon order
   (D) Unit of k for first order reaction is Ms^{-1}

4. The rate constant of a reaction depends on
   (A) temperature
   (B) pressure
   (C) extent of reaction
   (D) initial concentration of the reactant

5. For a reaction the initial rate is given as :
   $R_0 = k[A]_0^2[B]_0$ by what factor, the initial rate of reaction will increase if initial concentration of A is taken 1.5 times and of B is tripled?
   (A) 4.5   (B) 2.25
   (C) 6.75   (D) None of these

6. For $A_{(s)} + B_{(s)} \rightarrow C_{(s)}$; rate $= k[A]^{1/2}[B]^2$, if initial concentration of A and B are increased by factors 4 and 2 respectively, then the initial rate is changed by the factor:
   (A) 4   (B) 6
   (C) 8   (D) None of these

7. Reaction $A \rightarrow B$ follows second order kinetics. Doubling the concentration of A will increase the rate of formation of B by a factor of:
   (A) 1/4   (B) 1/2
   (C) 2   (D) 4

8. The unit of rate constant of zero order and first order chemical reactions are respectively :
   (A) $mol \, L^{-1} \, s^{-1}$, $mol \, L^{-1} \, s^{-1}$
   (B) s^{-1}, $mol \, L^{-1} \, s^{-1}$
   (C) $mol \, L^{-1} \, s^{-1}$, s^{-1}
   (D) None of these

9. The units of rate of reaction and rate constant are same for a:-
   (A) zero order reaction
   (B) first order reaction
   (C) second order reaction
   (D) third order reaction

10. For an elementary reaction $2A + B \rightarrow A_2B$ if the volume of vessel is quickly reduced to half of it's original volume then rate or reaction will
   (A) Unchange
   (B) Increase four times
   (C) Increase eight times
   (D) Decrease eight times

11. For the reaction

$$3A(g) \xrightarrow{\ k\ } B(g) + C(g), k \text{ is } 10^{-14} L/mol.min.$$
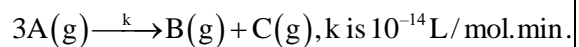
if [A] = 0.5M then the value of

$$-\frac{d[A]}{dt} \left(\text{in Ms}^{-1} \right) \text{is:}$$

(A) 7.5×10^{-5} (B) 3×10^{-4}

(B) 25×10^{-5} (D) None of these

ANSWERS

1. (D)
2. (D)
3. (D)
4. (A)
5. (C)
6. (C)
7. (D)
8. (C)
9. (A)
10. (C)
11. (D)

Note – If you have any query/issue

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