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TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

I-CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP NO. 1

Organic Chemistry : CHEMICAL KINETICS

1. For a Chemical reaction

$4A + 3B \rightarrow 6C + 9D$

rate of formation of C is 6×10^{-2} mol L^{-1} s^{-1} and rate of disappearance of A is 4×10^{-2} mol L^{-1} s^{-1}. The rate of reaction and amount of B consumed in interval of 10 seconds, respectively will be :

(1) 1×10^{-2} mol L^{-1} s^{-1} and 30×10^{-2} mol L^{-1}

(2) 10×10^{-2} mol L^{-1} s^{-1} and 10×10^{-2} mol L^{-1}

(3) 1×10^{-2} mol L^{-1} s^{-1} and 10×10^{-2} mol L^{-1}

(4) 10×10^{-2} mol L^{-1} s^{-1} and 30×10^{-2} mol L^{-1}

2. In a reaction, A + B $\rightarrow$ Product, rate is doubled when the concentration of B is doubled, and rate increases by a factor of 8 when the concentrations of both the reactants (A and B) are doubled, rate law for the reaction can be written as :

(1) Rate = $k[A][B]^2$ (2) Rate = $k[A]^2[B]^2$ (3) Rate = $k[A][B]$ (4) Rate = $k[A]^2[B]$

3. When initial concentration of a reactant is doubled in a reaction, its half-life period is not effected. The order of the reaction is :

(1) First (2) Second

(3) More than zero but less than first (4) Zero

4. When initial concentration of the reactant is doubled, the half-life period of a zero order reaction

(1) in halved (2) remains unchanged

(3) is tripled (4) is doubled

5. For the reaction, $2A \rightarrow B$. rate = $k[A]^2$.

If concentration of reactant is doubled, then the

(a) rate of reaction will be doubled.

(b) rate constant will remain unchanged, however rate of reaction is directly proportional to the rate constant.

(c) rate constant will change since reaction and rate constant are proportional to each other.

(d) rate of reaction will increase by four times. Identify the set of correct statements:

Choose the **correct answer** from the optio given below:

(1) (a), (b)only (2) (b), (d) only (3) (c), (d)only (4) (a), (c) only

6. For a certain reaction, the rate = $k[A]^2[B]$, when the initial concentration of A is tripled keeping concentration of B constant, the initial rate would

(1) increase by a factor of six. (2) increase by a factor of nine.

(3) increase by a factor of three. (4) decrease by a factor of nine.

7. For a reaction $3A \rightarrow 2B$

The average rate of appearance of B is given by $\frac{\Delta[B]}{\Delta t}$.

The correct relation between the average rate of appearance of B with the average rate of disappearance of A is given in option:

(1) $\frac{-\Delta[A]}{\Delta t}$ (2) $\frac{-3\Delta[A]}{2\Delta t}$ (3) $\frac{-2\Delta[A]}{3\Delta t}$ (4) $\frac{\Delta[A]}{\Delta t}$

8. The correct option for the rate law that corresponds to overall first order reaction is:

(1) Rate = k $[A]^0$ $[B]^2$ (2) Rate = k [A] [B]

(3) Rate = k $[A]^{1/2}[B]^2$ (4) Rate = k $[A]^{-1/2}$ $[B]^{3/2}$

9. In a zero- order reaction for every 10° rise of temperature, the rate is doubled. If the temperature is increased from 10°C to 100°C, the rate of the reaction will become :

(1) 256 times (2) 512 times (3) 64 times (4) 128 times

10. The rate of a first-order reaction is 0.04 mol ℓ^{-1} s^{-1} at 10 seconds and 0.03 mol ℓ^{-1} s^{-1} at 20 seconds after initiation of the reaction. The half-life period of the reaction is :

(1) 54.1 s (2) 24.1 s (3) 34.1 s (4) 44.1 s

11. The decomposition of phosphine (PH_3) on tungsten at low pressure is a first-order reaction. It is because the

(1) Rate of decomposition is very slow

(2) Rate is proportional to the surface coverage

(3) Rate is inversely proportional to the surface coverage

(4) Rate is independent of the surface coverage

12. A first order reaction has a specific reaction rate of 10^{-2}. How much time will it take for 20 g of the reaction to reduce to 5 g ?

(1) 238.6 sec (2) 138.6 sec (3) 346.5 sec (4) 693.0 sec

13. The correct difference between first and second-order reactions is that

(1) The rate of a first-order reaction does not depend on reactant concentrations; the rate of a second order reaction does depend on reactant concentrations

(2) The rate of a first-order reaction does depend on reactant concentrations; the rate of a second-order reaction does not depend on reactant concentrations

(3) A first-order reaction can be catalyzed; a second –order reaction cannot be catalyzed

(4) The half-life of a first-order reaction does not depend on $[A]_0$; the half-life of a second-order reaction does depend on $[A]_0$

14. If the rate constant for a first order reaction is k, the time (t) required for the completion of 99% of the reaction is given by :

(1) t = 2.303 /k (2) t = 0.693 / k (3) t = 6.909 /k (4) t = 4.606 / k

15. A first order reaction has a rate constant of 2.303×10^{-3} s^{-1}. The time required for 40 g of this reactant to reduce to 10 g will be – [Given that $\log_{10} 2 = 0.3010$]

(1) 230.3 s (2) 301 s (3) 2000 s (4) 602 s

Answer Key

1.	(1)	**2.**	(4)	**3.**	(1)	**4.**	(4)	**5.**	(2)	**6.**	(2)	**7.**	(3)
8.	(4)	**9.**	(2)	**10.**	(2)	**11.**	(2)	**12.**	(2)	**13.**	(4)	**14.**	(4)
15.	(4)												