

ST. LAWRENCE HIGH SCHOOL A JESUIT CHRISTIAN MINORITY INSTITUTION SOLUTION-24(CLASS-12) TOPIC- CHEMICAL KINETICS SUBTOPIC-RATE KINETICS



F.M. - 15 DATE -19.06.20

SUBJECT – CHEMISTRY DURATION – 30 mins

1.1 The half-life period of first order reaction is 1386 seconds. The specific rate constant of the reaction is-

a) $0.5 \times 10^{-2} \text{ s}^{-1} \text{ b}$) $0.5 \times 10^{-3} \text{ s}^{-1} \text{ c}$) $5.0 \times 10^{-2} \text{ s}^{-1} \text{ d}$) $5.0 \times 10^{-3} \text{ s}^{-1}$

Ans. b

1.2 The rate constant of a reaction $A \rightarrow B$ is 0.6 × 10³ mole per second. If the concentration of [A] is 5 M, then what will be concentration of [B] after 20 months?

(a) 0.36 M (b) 0.72 M (c) 1.08 M (d) 3.60 M Ans. b

1.3 A first order reaction has specific reaction rate 10⁻²s⁻¹. How much time it will take for 20g of reactant to reduce to 5g?

a) 138.6 s b) 346.5 s c) 693.0 s d) 238.6 s Ans. a

1.4 The rate of first order reaction is 0.04 mol $L^{-1} s^{-1}$ at 10 sec. and 0.03 mol L^{-1} at 2C seconds after initiation of the reaction. $t_{1/2}$ of reaction is-

(a) 44.1 s (b) 54.1 s (c) 24.1 s (d) 34.1 s **Ans. c**

1.5 If the initial concentration of reactant is doubled, $t_{1/2}$ is also doubled, the order of reaction is-

a) 0 b) 1 c) 2 d) 3 **Ans. a**

1.6 If cone, of reactant 'A' is increased 10 times and rate of reaction becomes 100 times. What is order with respect to 'A'? a) 1 b) 2 c) 3 d) 4

Ans. b

1.7 In the first order reaction the concentration of reactant decreases from 0.6 M to 0.3 M in
30 minutes. The time taken for the concentration to change from 0.1 M to 0.025 M:
(a) 60 min (b) 30 min (c) 15 min (d) 50 min
Ans. a

1.8 A first order reaction is 50% completed in $1.26 \times 10_{14}$ s. How much time would it take for 100% completion?

a) 1.26 \times 10 15 s b) 2.52 \times 10 14 s c) 2.52 \times 10 28 s d) Infinite Ans. d

1.9 For the reaction N₂ + 3H₂ \rightarrow 2NH₃ if $\frac{\Delta[NH_3]}{\Delta t}$ = 2 × 10⁻⁴ mol L⁻¹s⁻¹, the value of $\frac{-\Delta[H_2]}{\Delta t}$ would be-

a) 1×10^{-4} mol L⁻¹s⁻¹ b) 3×10^{-4} mol L⁻¹s⁻¹ c) 4×10^{-4} mol L⁻¹s⁻¹ d) 6×10^{-4} mol L⁻¹s⁻¹ Ans. b

1.10 The rate of a certain hypothetical reaction: A + B + C \rightarrow products is given by r = $\frac{-d[A]}{dt} K[A]^{1/2}[B]^{1/3}[C]^{1/4}$. The order of the reaction is-a) 13/11 b) 13/14 b) 12/13 d) 13/12 Ans. d

1.11 In the formation of S0₂ by contact process; $2SO_2 + O_2 \rightarrow 2SO_3$, the rate of reaction was measured as- $\frac{-d[O_2]}{dt}$ = 2.5 × 10⁻⁴ mol L⁻¹s⁻¹. The rate of formation of S0₃ will bea) -5.0 × 10⁻⁴ mol L⁻¹s⁻¹ (b) -1.25 × 10⁻⁴ mol L⁻¹s⁻¹ (c) 3.75 × 10⁻⁴ mol L⁻¹s⁻¹ (d) 5.00 × 10⁻⁴ mol L⁻¹s⁻¹ Ans. d

1.12 For a chemical reaction $A \rightarrow B$, it is found that the rate of reaction doubles when the concentration of A is increased four times. The order of reaction is-

a) 2 b) 1 c) Half d) Zero **Ans. c**

1.13 Which among the following is a false statement?

a) Rate of zero order reaction is independent of initial concentration of reactant.

b) Half-life of a third order reaction is inversely proportional to square of initial concentration of the reactant.

c) Molecularity of a reaction may be zero or fraction

d) For a first order reaction: $t_{1/2} = 0.693/K$

Ans. c

1.14 RCOOR' + H₂O \longrightarrow RCOOH + R'OH what type of reaction is this? a) Second order b) Unimolecular c) Pseudo-unimolecular d) Third order Ans. c

1.15 The half-life of the first order reaction having rate constant K = 1.7 x 10^{-5} s⁻¹ is-

a) 12.1 h b) 9.7 h c) 11.3 h d) 1.8 h

Ans. c

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