ST. LAWRENCE HIGH SCHOOL
A JESUIT CHRISTIAN MINORITY INSTITUTION
SOLUTION-25(CLASS-12)
TOPIC- CHEMICAL KINETICS
SUBTOPIC- RATE KINETICS

SUBJECT – CHEMISTRY   **F.M. - 15**
DURATION – 30 mins   **DATE -20.06.20**

1.1 Radioactivity of a sample (z = 22) decreases 90% after 10 years. What will be the half-life of the sample?

a) 3 years b) 10 years c) 2 years d) 5 years

Ans. a

1.2 The time required for 100% completion of a zero order reaction is-

(a) a/2k (b) ak (c) 2k/a (d) a/k
Ans. d

1.3 In a first order reaction, the concentration of the reactant decreases from 0.8 M to 0.4 M in 15 minutes. The time taken for the concentration to change from 0.1 M to 0.025 M is-

a) 15 mins b) 60 mins c) 30 mins d) 7.5 mins
Ans. c

1.4 The time taken for 10% completion of a first order reaction is 20 min. Then, for 19% completion, the reaction will take-

(a) 50 mins (b) 60 mins (c) 30 mins (d) 40 mins
Ans. d

1.5 The half-life period of a first order chemical reaction is 6.93 minutes. The time required for the completion of 99% of the chemical reaction will be (log 2 = 0.301)-

a) 46.06 mins b) 23.03 mins c) 460.6 mins d) 230.3 mins
Ans. a

1.6 The activation energy of a reaction at a given temperature is found to be 2.303 RT J mol^{-1}. The ratio of rate constant to the Arrhenius factor is-

a) 0.1 b) 0.01 c) 0.001 d) 0.02
Ans. a

1.7 The reaction: A → B follows first order kinetics. The time taken for 0.8 mol of A to produce 0.6 mol of B is 1 hour. What is the time taken for conversion of 0.9 mol of A to produce 0.675 mol of B?

(a) 2 hours (b) 0.25 hours (c) 0.5 hours (d) 1 hour
Ans. d

1.8 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-

a) 256 times b) 512 times c) 64 times d) 128 times
Ans. b

1.9 In the hydrolysis of an organic chloride in presence of large excess of water,
RCl + H$_2$O → ROH + HCl-
a) Molecularity and order of reaction both are 2 b) Molecularity is 2 but order of reaction is 1
c) Molecularity is 1 but order of reaction is 2   d) Moecularity is 1 and order of reaction is also 1
Ans. b

1.10 A reaction involving two different reactants can never be-

a) First order reaction b) Bimolecular reaction b) Second order reaction d) Unimolecular reaction
Ans. d

1.11 The rate of a chemical reaction doubles for every 10°C rise of temperature. If the temperature is raised by 50°C, the rate of the reaction increases by about-

a) 64 times (b) 10 times (c) 24 times (d) 32 times
Ans. d

1.12 A catalyst is a substance which-
a) Shortens the time to reach equilibrium b) Increases the equilibrium constant of the reaction.
c) Increases the equilibrium concentration of the product d) Supplies energy to the reaction
Ans. a

1.13 For the reaction A + B → products, it is observed that (i) On doubling the concentration of A only, the rate of reaction is also doubled. (ii) On doubling the initial concentration of both A and B, there is change by a factor of 8 in the rate of reaction. The rate of reaction is given by-

a) Rate = k [A] [B] b) Rate = k [A]^2 [B] c) Rate = k [A] [B]^2 d) Rate = k [A]^2 [B]^2
Ans. c

1.14 $t_{1/4}$ can be taken as the time taken for the concentration of a reactant to drop to 3/4 of its initial value. If rate constant for a first order reaction is k, then $t_{1/4}$ can be written as-

a) 0.01/k b) 0.29/k c) 0.69/k d) 0.75/k
Ans. b

1.15 The rate of reaction between two reactants A and B decreases by a factor of 4 if the concentration of reactant B is doubled. The order of reaction with respect to reactant B is-

a) 2 b) -2 c) 1 d) -1
Ans. b

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