ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

WORKSHEET-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

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

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

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

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

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

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

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

1.9 In the hydrolysis of an organic chloride in presence of large excess of water,

$RCl + H_2O \rightarrow ROH + HCl$

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

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

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

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

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

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- b

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

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