ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION-28(CLASS-12)

TOPIC- CHEMICAL KINETICS

SUBTOPIC- RIVISION ON CHEMICAL KINETICS

SUBJECT – CHEMISTRY **F.M. - 15**

DURATION – 30 mins **DATE -24.06.20**

1.1 The role of a catalyst is to change _____

(a) Gibbs energy of reaction (b) Enthalpy of reaction (c) Activation energy of reaction

(d) Equilibrium constant

Ans. c

1.2 In the presence of a catalyst, the heat evolved or absorbed during the reaction:

(a) Increases (b) Decreases (c) Remains unchanged (d) May increase or decrease.

Ans. c

1.3 Activation energy of a chemical reaction can be determined by:

(a) Determining the rate constant at standard temperature

(b) Determining the rate constants at two temperatures

(c) Determining probability of collision (d) Using catalyst

Ans. b

1.4 Consider the Arrhenius equation and mark the correct option:

(a) Rate constant increases exponentially with increasing activation energy and decreasing temperature.

(b) Rate constant decreases exponentially with increasing activation energy and decreasing temperature.

(c) Rate constant increases exponentially with decreasing activation energy and decreasing temperature.

(d) Rate constant increases exponentially with decreasing activation energy and increasing temperature.

Ans. d

1.5 **Which of the following statements is not correct about order of a reaction?**

(a) The order of a reaction can be a fractional number.

(b) Order of a reaction is experimentally determined quantity.

(c) The order of a reaction is always equal to the sum of the stoichiometric coefficients of reactants in the balanced chemical equation for a reaction.

(d) The order of a reaction is the sum of the powers of molar concentration of the reactants in the rate law expression.

Ans. c

1.6 Which of the following statements is correct?

a) The rate of a reaction decreases with passage of time as the concentration of reactants decreases.

b) The rate of a reaction is same at any time during the reaction.

c) The rate of a reaction is independent of temperature change.

d) The rate of a reaction decreases with increase in concentration of reactant(s).

Ans. a

1.7 Rate law for the reaction A + 2B → C is found to be

Rate = k [A] [B]. Concentration of reactant 'B' is doubled, keeping the concentration of 'A' constant, the value of rate constant will be-

(a) The same (b) Doubled (c) Quadrupled (d) Halved

Ans. b

1.8 Which of the following statements is incorrect about the collison theory of chemical reaction?

(a) It considers reacting molecules or atoms to be hard spheres and ignores their structural features.

(b) Number of effective collisions determines the rate of reaction.

(c) Collision of atoms or molecules possessing sufficient threshold energy results into the product formation.

(d) Molecules should collide with sufficient threshold energy and proper orientation for the collision to be effective.

Ans. c

1.9 A first order reaction is 50% completed in 1.26×10^{14} s. How much time would it take for 100% completion?

(a) 1.26×10^{15} s (b) 2.52×10^{14} s (c) 2.52×10^{28} s (d) infinite

Ans. d

1.10 Compounds 'A' and 'B' react according to the following chemical equation.

A (g) + 2 B (g) → 2C (g)

Concentration of either 'A' or 'B' were changed keeping the concentrations of one of the reactants constant and rates were measured as a function of initial concentration. Following results were obtained. Choose the correct option for the rate equations for this reaction.

a) Rate = k $[A]^2$ [B] b) Rate = k [A] $[B]^2$ c) Rate = k [A] [B] d) Rate = k $[A]^2$ $[B]^0$

Ans. b

1.11 Which of the following statement is not correct for the catalyst?

a) It catalyses the forward and backward reaction to the same extent.

b) It alters ΔG of the reaction.

c) It is a substance that does not change the equilibrium constant of a reaction.

d) It provides an alternate mechanism by reducing activation energy between reactants and products.

Ans. b

1.12 The value of rate constant of a pseudo first order reaction

a) Depends on the concentration of reactants present in small amount.

b) Depends on the concentration of reactants present in excess.

c) It is independent of the concentration of reactants.

d) Depends only on temperature.

Ans. b

1.13 Rate law can be determined from balanced chemical equation if

(a) Reverse reaction is involved.

(b) It is an elementary reaction.

(c) It is a sequence of elementary reactions.

(d) Any of the reactants is in excess.

Ans. b

1.14 Which of the following statements are applicable to a balanced chemical equation of an elementary reaction?

a) Order is same as molecularity.

b) Order is less than the molecularity.

c) Order is greater than the molecularity.

d) Molecularity can never be zero.

Ans. a and d

1.15 For a complex reaction:

a) Order of overall reaction is same as molecularity of the slowest step

b) Order of overall reaction is less than the molecularity of the slowest step

c) Order of overall reaction is greater than molecularity of the slowest step

d) Molecularity of the slowest step is never zero or non-integer

Ans. a and d

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