ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

FOR GOD AND COUNTRY

SOLUTION-26(CLASS-12)

TOPIC- CHEMICAL KINETICS

SUBTOPIC-RATE KINETICS AND ACTIVATION ENERGY

SUBJECT – CHEMISTRY **F.M. - 15**

DURATION – 30 mins **DATE -22.06.20**

1.1 Which of the following are best to explain the action of negative catalyst in a chemical reaction?

a) It decreases the rate of the reaction because smaller fraction of the total molecules will react due to increase of energy activation. b) It decreases the rate constant because the adding catalyst recovered unchanged at the end of the reaction c) It decreases the rate of reaction because rate constant for the reaction increases. d) None of These

Ans. a

1.2 A catalyst functions by:

(a) Providing a reaction path with a lower activation energy (b)Lowering the energy of the products(c) Increasing the equilibrium constant. (d) Lowering the energy of the reactants.

Ans. a

1.3Reaction rates increase with temperature because as the temperature increases:

a) The activation energy decreases. b) The activation energy increases

c) The equilibrium constant increases. d) The rate constant increases.

Ans. d

1.4 The following reaction is found to be first order in H_2 (g) and second order in NO (g). The rate law for this reaction is: $2NO\ (g) + 2H_2 \rightarrow N_2\ (g) + 2H_2O\ (g)$:

(a) Rate = $k[NO]^2[H_2]$ (b) Rate = $k[NO]^2[H_2]^2$(c) Rate = $k[NO][H_2]^2$

(d) Rate = $k[NO]^2[H_2]^2/[N2][H_2O]^2$

Ans. a

1.5 **A 1.000 g sample of live grass gives 116 decays per hour of carbon-14. A 1.000 g sample of grass found in an Egyptian tomb gives 34 decays per hour. The half-life of carbon-14 is 5720 years. How old, in years, is the ancient grass?**

a) 10100 b) 1680 c) 19500 d) 7020

Ans. a

1.6 For a certain reaction, it is found that the equation relating the specific rate constant, k(M/s), and absolute temperature, T, is: lnk = (-)4420/T + 12.20. What is the value of the specific rate constant, k(M/s) at 500 K?

a) 3.36 b) 28.8 c) 21.04 d) 10.4

Ans. b

1.7 Which of the following would NOT increase the rate of reaction-

(a) Increasing the concentration of reactants (b) Adding a catalyst

(c) Increasing the volume of the container for a gaseous reaction. (d) Raising the temperature

Ans. c

1.8In a reaction: 2A—->B + 2C, which of the statement is true?

a) Rate of disappearance of A=Rate of formation of C b) Rate of formation of B = Rate of disappearance of A c) Rate of formation of C= Rate of formation of B d) Both a and b

Ans. d

1.9 For a certain first order reaction, it is found that it takes 156 seconds for the concentration of reactant to fall from 0.100 M to 0.0500 M. How much time would it take for the concentration of reactant to fall from 0.0500 M to 0.0250 M?

a)156 b)12.5 c)76d) 312

Ans. a

1.10The slow rate of a particular chemical reaction might be attributed to which of the following?

a) The presence of a catalyst b)A low activation energy c)The temperature is high d) A high activation energy

Ans. d

1.11 The half-life for the first order decomposition of nitromethane, CH_3NO_2, at 500K is 650 seconds. If the initial concentration of CH_3NO_2 is 0.500M, what will its concentration be (M) after 1300 seconds have elapsed?
a) 0.125 (b) 0.140 (c) 0.250 (d) 0.425

Ans. a

1.12In a chemical reaction, only those collisions of molecules are effective in which the colliding molecules possess a minimum amount of energy called?

a) Average internal energy b) Activation energy. c) None of these d) Threshold energy.

Ans. b

1.13 Powdered marble reacts more rapidly with HCl than the chips of marble because:

a) None of these b) Energy of activation decreasesc) Number of molecules increases. d) Surface area of powdered marble is more that of chips of marble and hence there is more collisions between the molecules of reactants

Ans. d

1.14 In case of slow reaction, if the temperature is increased by 10 K, then point out the false statement?

a) Average K.E decreases b) Energy of activation decreases c) Threshold energy increases

d) Number of collisions, get multiplied

Ans. a

1.15Among the following reactions, the fastest one?

a) Rusting of iron b) Burning of coal c) Conversion of monoclinic sulphur to rhombic Sulphur

d) Precipitation of AgCl by mixing $AgNO_3$ and NaCl solutions

Ans. d

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