CHEMISTRY

BOOKS - NIKITA CHEMISTRY (HINGLISH)

CHEMICAL KINETICS

Mcqs

1. The rate of chemical reaction (except zero order)

A. decreases from moment to moment

B. independent constant throughout

C. independent of the order of reaction

D. reamin unchange

Answer:

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2. For the reaction ,$A + 2B \rightarrow C$, the rate of reaction at a given instant can be represented by _____.

A. $+\frac{d[A]}{dt} = +\frac{1}{2}\frac{d[B]}{dt} = +\frac{d[C]}{dt}$

B. $\frac{d[A]}{dt} = +\frac{1}{2}\frac{d[B]}{dt} = -\frac{d[C]}{dt}$

C. $-\frac{d[A]}{dt} = -\frac{1}{2}\frac{d[B]}{dt} = +\frac{d[C]}{dt}$

D. $+\frac{d[A]}{dt} = +\frac{1}{2}\frac{d[B]}{dt} = +\frac{d[C]}{dt}$

Answer:

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3. The rate constant of n^{th} order has units :

A. $litre^{1-n}mol^{-n}\sec^{-1}$

B. $mol^{1-n}litre^{1-n}\sec^{-1}$

C. $mol^{1-n}litre^{n-1}\sec^{-1}$

D. $\sec^{-1}$

Answer:

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4. The rate of a reaction is expressed in different ways as follows:

$$+\frac{1}{2}\frac{d[C]}{dt} = -\frac{1}{3}\frac{d[D]}{dt} = +\frac{1}{4}\frac{d[A]}{dt} = -\frac{d[B]}{dt}$$

the reaction is

A. $4A + B \rightarrow 2C + 3D$

B. $B + 3D \rightarrow 4A + 2C$

C. $A + B \rightarrow C + D$

D. $B + D \rightarrow A + C$

Answer:

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5. Which does not influence the rate of reaction

A. pressure

B. concentration of reactant

C. temperature

D. molecularity

Answer:

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6. On addition of $AgNO_3$ to NaCl, white ppt. occurs

A. instantaneously

B. with a measurable speed

C. slowly

D. very slow

Answer:

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7. The rate of formation of ammonia by the reaction:

$N_2 + 3H_2 \rightarrow 2NH_3$

expressed as $\frac{d[NH_3]}{dt} = 2.5 \times 10^{-4} molL^{-1}s^{-1}$

The rate of consumption expressed in terms of H_2 as $\frac{-d[H_2]}{dt}$

will be

A. double

B. Three times

C. Same

D. one and a half time of that expressed in terms of NH_3

Answer:

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8. The temperature coefficient of a reaction is:

A. the rate constant at a fixed temperature

B. the ratio of rate constant at two temperatures

C. the ratio of rate constant differing by 10° preferably 25° and 35° C

D. none

Answer:

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9. For the reaction

$4A + B \rightarrow 2C + 2D$ which of the following statements is not correct:

A. the rate of disappearance of B is one fourth of the rate of disappearance of A

B. the rate of formation of C is one- half of the rate of consumption of A

C. the rate of appearance of D is half of the rate of disappearance of B

D. the rates of formation of C and D are equal

Answer:

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10. For the reaction $A + B + C \rightarrow$ products , the term $(-d[C]/dt)$ in rate equation refers to

A. the concentration of a reactant

B. the decrease in concentration of the reactant with time

C. the velocity constant of reaction

D. none

Answer:

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11. For the reaction $A + B \rightarrow C + D$, the variation of the concentration of the reactant with time sis given by the curve

A. I

B. II

C. III

D. IV

Answer:

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12. The rate of reaction:

A. decreases with time

B. decreases with decrease in concentration of reactant

C. decreases with increase in time and decrease in concentration of reactant

D. none

Answer:

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13. for a gaseous reaction, the unit of rate of reaction are

A. L atm s^{-1}

B. atm s^{-1}

C. atm $mol^{-1}s^{-1}$

D. $mols^{-1}$

Answer: B

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14. Which statement is correct for $X + 2Y \rightarrow P$?

A. the rate of disappeance of X

= twice the rate of disappearance of Y

B. the rate of disappearance of X

$= \frac{1}{2}$ rate of appearance of products

C. the rate of appearance of products

$= \frac{1}{2}$ the rate of disappearance of Y

D. the rate of appearance of products

$= \frac{1}{2}$ the rate of disappearance of X

Answer:

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15. Which of the following is true for order of a reaction?

A. It is eqaul to the sum of exponents of the molar concentration of the reactants in the rate equation

B. It is always a whole number

C. It is never zero

D. It can be determined theoretically

Answer:

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16. Select the intermediate in the following reaction mechanism

$$O_{3(g)} \rightarrow O_{2(g)} + O_{(g)} + O_{3(g)} \rightarrow 2O_2$$

A. $O_{3(g)}$

B. $O_{(g)}$

C. $O_{2(g)}$

D. none

Answer:

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17. The rate of reaction $A + B + C \rightarrow$ Products is given Rate $= K[A]^{\frac{1}{2}}[B]^{\frac{1}{3}}[C]$. The order of the reaction is

A. 1

B. 3

C. $\frac{5}{6}$

D. $\frac{11}{6}$

Answer: D

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18. The rate constant of a reaction depends on

A. temperature

B. initial concentration of the reactants

C. time of reaction

D. extent of reaction

Answer:

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19. What is the order of a reaction which has a rate expression, i.e. rate = $k[A]^{3/2}[B]^{-1}$?

A. $\frac{3}{2}$

B. $\frac{1}{2}$

C. zero

D. none of these

Answer:

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20. The large increase in the rate of the reaction due to rise in temperature is due to

A. increase in the number of collisions

B. decrease in the number of activated molecules

C. lowering os activation energy

D. shortening of the mean free path

Answer:

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21. Which of the following rate laws has an overall order of 0.5 for reaction involving substances x, y and z ?

A. Rate = $K(C_x)(C_y)(C_z)$

B. Rate $= K(C_x)^{0.5}(C_y)^{0.5}(C_z)^{0.5}$

C. Rate $= K(C_x)^{1.5}(C_y)^{-1}(C_z)^{0}$

D. Rate $= K(C_x)(C_y)^{0.5}/(C_z)^{2}$

Answer:

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22. Rate of a reaction

A. increases with increase in temperature

B. decreases with increase in temperature

C. doesnot depend on temperature

D. does not depend on concentration

Answer:

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23. A reaction involves two reactants. The rate of reaction is directly proportional to the concentration of one of them and inversely proportional to the concentration of the other. The overall order of reaction will be

A. one

B. two

C. zero

D. none of these

Answer:

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24. The reaction rate of the reaction $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$ is given by $r = k[H_2][Br_2]^{1/2}$

Which of the following statement/is/are true ?

A. the reaction is of second order

B. molecularity of the reaction is 3/2

C. the unit of k is $\sec^{-1}$

D. molecularity of the reaction is 2

Answer:

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25. Order of a reaction can be

A. fractional

B. zero

C. integer

D. all the above

Answer:

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26. $-\frac{d[H_2O_2]}{dt}$ represented

A. rate of formation of H_2O_2

B. rate of decompotion of H_2O_2

C. order of reaction

D. none

Answer:

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27. Which one of the following statements is incorrect ?

A. Rate law expression connot be written from the stoichiometric equation.

B. Law of mass action expression can be written from the balanced equation

C. Specific reaction rate of a reaction is constant at constant temperature

D. Rate of reaction and rate constant have same units

Answer:

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28. Which of the following is a reaction of first order ?

A. $2N_2O_5 \rightarrow 4NO_2 + O_2$

B. $2HI \rightarrow H_2 + I_2$

C. $2NO_2 \rightarrow 2NO + O_2$

D. $2NO + O_2 \rightarrow 2NO_2$

Answer:

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29. The sum of the power to which the concentration of substance apears in the rate expression is known as _____.

A. rate of reaction

B. molecularity of reaction

C. order of reaction

D. none

Answer:

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30. The decomposition of acetaldehyde is a reaction of the order

A. 1

B. 2

C. 1.5

D. 2.5

Answer:

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31. If concentration of reactant is increased by 'm' then k becomes :

A. $e^{k/X}$

B. $\frac{k}{X}$

C. k

D. $\frac{X}{k}$

Answer:

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32. The reactions of higher order are rare because

A. many body collisions involve very high activation energy

B. many body collisions have a low probability energy

C. many body collisions are not enegetically favoured

D. many body collisions are take place only in the gaseous phase.

Answer:

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33. The rate of fchemical reaction depends on the nature of chemical reactions, because

A. the threshold energy level differs from one reaction to another

B. some of the reactant are solid at room temperature

C. some of the reactants are coloured

D. all

Answer:

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34. Unit of rate constant depends on

A. order of reaction

B. molecularity of the reaction

C. concentration terms

D. number of reactants

Answer:

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35. Reaction $A \rightarrow B$ follows second order kinetics. Doubling the concentration of A wil increase the rate of formation of B by a factor of :

A. $1/4$

B. 2

C. $1/2$

D. 4

Answer:

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36. The given reaction

$2FeCl_3 + SnCl_2 \rightarrow 2FeCl + SnCl_4$

is an example of

A. first order reaction

B. second order reaction

C. third order reaction

D. none of these

Answer:

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37. For a reaction, $2A + B \rightarrow C + D$, $-\frac{d[A]}{dt} = k[A]^2[B]$. The expression for $\frac{-d[B]}{dt}$ will be

A. $k[A]^2[B]$

B. $\frac{1}{2}k[A]^2[B]$

C. $k[A]^2[2B]$

D. $k[2A]^2[B]$

Answer:

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38. The rate constant of a reaction changes when

A. a catalyst is added

B. concentrations of the reactant are changed

C. temperature of changed

D. both (a) and (c)

Answer:

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39. In many reactions, the reaction proceeds in a sequence of stemps, so the overall rate is determined by

A. order of different steps

B. slowest step

C. molecularity of the stemps

D. fastest step

Answer:

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40. In which of the following case does the reaction go farthest to completion?

A. $k = 10^2$

B. $k = 10^{-2}$

C. $k = 10$

D. $k = 1$

Answer:

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41. Which will lead to a change in the rate constant k of a reaction

A. A change in the pressure

B. change in temperature

C. change in the volume of the reaction vessel

D. all

Answer: B

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42. The unit of rate constant for zero order reaction is :

A. litre $\sec^{-1}$

B. litre $mol^{-1}\sec^{-1}$

C. $mollitre^{-1}\sec^{-1}$

D. $mol\sec^{-1}$

Answer:

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43. The rate of a reaction can be increased in general by all the factors except

A. using a catalyst

B. increasing the temperature

C. invreasing the activation energy

D. increasing the conc. of reactants

Answer:

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44. The rate constant of a reaction has same dimensions as rate of reaction The reaction is of

A. zero order

B. first order

C. second order

D. none of these

Answer:

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45. Which is not used in the determination of reaction rates

A. reaction temperature

B. reaction concentration

C. specific rate constant

D. none

Answer:

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46. The rate constant of a reaction is $2.5 \times 10^{-2} \text{minutes}^{-1}$

The order of the reaction is

A. one

B. zero

C. two

D. three

Answer:

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47. Equation for the half period in first order reaction is

A. $t_{1/2} = \frac{0.602}{k}$

B. $t_{1/2} = \frac{0.693}{k}$

C. $t_{1/2} = \frac{k}{0.693}$

D. $t_{1/2} = \frac{k}{0.602}$

Answer:

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48. The rate constant of a reaction is $2.1 \times 10^{-2} mol^{-2} litre^3 \min^{-1}$. The order of reaction is

A. zero order

B. 1

C. 2

D. 3

Answer:

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49. Which of the following statementsw about the order of a reaction is correct ?

A. the order of reaction must be a positive integer

B. a second order reaction is also bimolecular

C. the order of reaction invereases with increasing temperature

D. the order of reaction can only be determined by experimentally.

Answer:

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50. The correct expression the rate of reaction of elementary reaction, $A + B \rightarrow C$ is

A. $\frac{d[C]}{dt} = k[A]$

B. $\frac{d[C]}{dt} = k[B]$

C. $\frac{-d[A]}{dt} = k[A][B]$

D. $\frac{-d[A]}{dt} = k[A]$

Answer:

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51. The second order rate constant is usually expressed as

A. mol litre $\sec^{-1}$

B. $mol^{-1}litre^{-1}\sec^{-1}$

C. $mollitre^{-1}\sec^{-1}$

D. $mol^{-1}litre\sec^{-1}$

Answer:

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52. Number of mole of a substance present in 1 litre volume is known as

A. activity

B. molar concentration

C. active mass

D. none

Answer:

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53. If the concentration is expressed in moles per liter, the unit of the rate constant for a first-order reaction is

A. mol $litre^{-1}\sec^{-1}$

B. $mollitre^{-1}$

C. $\sec^{-1}$

D. mol^{-1}

Answer:

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54. Which statement about molecularity of a reaction is wrong?

A. it is number of molecules of the reactants taking part in a single step of reaction

B. it si calculated from the reaction mechanism

C. it may be either whole number or fractional

D. none

Answer:

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55. The rate of chemical reaction is directly proportional to

A. active masses of reactants

B. equlilibrium constant

C. active masses of products

D. pressure

Answer:

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56. The rate of the reaction $CCl_3CHO + NO \rightarrow CHC_3 + NO + CO$ is given by Rate $= K[CCl_3CHO][NO]$. If concentration is expressed in moles $/$ litre, the units of K are

A. $litre^2 mol^{-2} \sec^{-1}$

B. $litre^{-1} mol \sec^{-1}$

C. $litremol^{-1}\sec^{-1}$

D. $\sec^{-1}$

Answer:

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57. A following mechanism has been proposed for a reaction

$2A + B \rightarrow D \rightarrow E$

$A + B \rightarrow C + D$(slow)

$A + C \rightarrow E$ (fast)

The rate law expression for the reaction by RDS methd is:

A. $R = K[A]^2[B]$

B. $R = k[A][B]$

C. $R = k[A]^2$

D. $R = k[A][B]$

Answer:

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58. The branch of chemistry which with the reaction rates and reaction mechanism is called

A. thermochemistry

B. photochemistry

C. analytical chemistry

D. chemical kinetics

Answer:

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59. The rate constant of a reaction is 10.8×10^{-5} mol $dm^{-3}s^{-1}$. The order of the reaction is

A. zero

B. 1

C. 2

D. 3

Answer:

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60. Which one of the following represents fastest reaction ?

A. $k = 5.5 \times 10^{-5}\,\text{sec}^{-1}$

B. $k = 3.3 \times 10^{-3}\,\text{sec}^{-1}$

C. $k = 6.6 \times 10^{-5}\,\text{sec}^{-1}$

D. $k = 4.4 \times 10^{-5}\,\text{sec}^{-1}$

Answer:

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61. The rate of a reaction is doubled when the concentration of reactant is doubled. What is the order of the reaction ?

A. two

B. one

C. half

D. one and a half

Answer:

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62. The rate determining step of a reaction is the step

A. which involves the minimum number of molecules

B. which involves the maximum number of molecules

C. which is the slowest

D. which is the fastest

Answer: C

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63. What is the unit of rate constant k when the order of reaction is 0.5 ?

A. $\sqrt{\sec}^{-1}$

B. $\left[Lmol^{-1}\right]^{1/2}\sec^{-1}$

C. $\left[molL^{-1}\right]^{1/2}\sec^{-1}$

D. $\sec^{-1}$

Answer:

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64. In a multistep reaction, the overall rate of reaction is

A. equal to the rate of slowest step

B. equal to the rate of fastest step

C. equal to the average rate of various steps

D. equal to the rate of the last step

Answer:

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65. In the sequence of reaction,

$L \xrightarrow{k_1} M \xrightarrow{k_2} N \xrightarrow{k_3} O$

$k_3 > k_2 > k_1$

The rate determining step of the reaction is :

A. $AotB$

B. $B \rightarrow C$

C. $CotD$

D. $AotD$

Answer:

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66. Which of the follwing statement is not correct for the reaction,

$4A + B \rightarrow 2C + 2D$?

A. the rate disappearance of B is one fourth the rate of disappearane of A

B. the rate of appearance of C is one half the rate of disappearance of B

C. the rate of formation of D is one half the rate of consumption of A

D. the rates of formation of C and D are equal

Answer:

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67. For a reaction $2A + B \rightarrow C + D$, the active mass of B is kept constant but tht of A is tripled. The rate of reaction will

A. increases six times

B. increases nine times

C. decreases three times

D. decreases nine times

Answer:

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68. A following mechanism has been proposed for a reaction:

$2A + B \rightarrow D + E$

$A + B \rightarrow C + D$ (slow)

$A + C \rightarrow E$ (fast)

The rate law expresison for the reaction is

A. Rate $k[A]^2[B]$

B. Rate $= k[A][B]$

C. Rate = k [A] [C]

D. Rate $= k[A]^2[B][C]$

Answer:

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69. The specific rate constant of a first order reaction depends on the

A. concentration of the reactant

B. concentration of product

C. time

D. temperature

Answer:

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70. The rate law for the reaction

$RCl + NaOH(aq) \rightarrow ROH + NaCl$ is given by

Rate $= k[RCl]$. The rate of the reaction will be

A. A

B. B

C. C

D. D

Answer:

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71. A hypothetical reaction $A_2 + B_2 \rightarrow 2AB$ follows the mechanism as given below:

$A_2 \Leftrightarrow A + A(\text{fast})$

$A + B_2 \rightarrow AB + B$ (slow)

$A + B \rightarrow AB$ (fast)

The order of the overall reaction is

A. 2

B. 1

C. $1\frac{1}{2}$

D. 0

Answer:

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72. The rate equation for a reaction $3A + 2B \rightarrow C$ is given by

$$\frac{dx}{dt} = k[A]^2[B]^1$$

which of the following statements is false

A. the reaction is overall a second order reaction

B. the rate will not be altered by doubling the concentration of B

C. temerature will have no effect on the rate of reaction

D. all are false

Answer:

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73. Order of a reaction can not be obtained

A. experimentally

B. from stoichiometry of the reaction

C. if the reactants are gases

D. if the reactants are in different physical states

Answer:

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74. For an exothermic chemical process ocuuring in two process occuring in two steps as follows

$(i) A + B \rightarrow X(\text{slow}) \qquad (ii) X \rightarrow AB(\text{fast})$

The progress of reaction can be best described by :

A. 

B. 

C. 

D. All are correct

Answer:

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75. Fot the reaction $A + B \rightarrow$ produts, it is found that orders of the reaction in A and B are 1 and 2 respectively. When the conc. of A is halved and that of B is doubled, the rate increases by a factor :

A. 2

B. 8

C. 4

D. 16

Answer:

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76. In a reaction $A + 2B \rightarrow$ products, the molecularity of the reaction is

A. 3

B. 2

C. 1

D. zero

Answer:

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77. For the reaction $N_2 + 3H_2 \rightarrow 2NH_3$, rate of reaction with respect to hydrogen may be expressed as $\frac{-d[H_2]}{dt}$. In it, the expression as $-\frac{d[H_2]}{dt}$ represents

A. a negative rate of reaction

B. amount of hydrogen left unreated

C. decrease in concentration of H_2 in unit time

D. decrease in the rate of change in concentration of hydrogen

Answer:

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78. For the reaction ,$A + 2B \rightarrow C$, the rate of reaction at a given instant can be represented by _____.

A. $+\frac{d[A]}{dt} = +\frac{1}{2}\frac{d[B]}{dt} = +\frac{d[C]}{dt}$

B. $+\frac{d[A]}{dt} = +\frac{1}{2}\frac{d[B]}{dt} = -\frac{d[C]}{dt}$

C. $-\frac{d[A]}{dt} = -\frac{1}{2}\frac{d[B]}{dt} = +\frac{d[C]}{dt}$

D. $+\frac{1}{2}\frac{d[A]}{dt} = +\frac{1}{2}\frac{d[B]}{dt} = +\frac{d[C]}{dt}$

Answer:

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79. The rate of a gaseous reaction is given by k[A] [B]. If the volume occupied by the reacting gases is suddenly reduced to half the original volume, the rate of the reaction relation relative to the initial rate will be

A. $1/8$

B. $1/4$

C. $8/1$

D. 4

Answer:

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80. A reaction proceeds by a two step mechanism

$A_2 \underset{k_2}{\overset{k_1}{\Longleftrightarrow}} 2A$ (fast reaction)

$A + B \rightarrow$ Products (slow reaction)

What is the rate law for the overall reaction ?

A. rate $= k[A_2][B]$

B. rate $= k[A_2]^2[B]$

C. rate $= k[A_2]^{\frac{1}{2}}$

D. rate $= k[A_2]^{\frac{1}{2}}[B]$

Answer:

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81. If the concentration units for the first order reaction is increased by 'm' times, then the rate constant k will be

A. km

B. k + m

C. k/ m

D. k

Answer:

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82. The reaction $NO_{2(g)} + O_{(g)} \rightarrow CO_{2(g)} + NO_{(g)}$ proceeds in the following two steps at 500 K

$NO_{2(g)} + NO_2 \rightarrow NO + NO_3$ Step - 1(slow)

$NO_3 + CO \rightarrow CO_2 + NO_2$ Step -2 (fast)

Which of the following rate expressions is correct for the above reaction ?

A. Rate $= -\frac{d(NO_2]}{dt} = k[NO_2]$

B. Rate $= -\frac{d[CO]}{dt} = k[NO_2]$

C. Rate $= -\frac{d[NO_2]}{dt} = k[NO_2]^2$

D. Rate $= -\frac{d[NO_2]}{dt} = k[NO_2][CO]$

Answer:

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83. The rate constant for reaction is 10.8×10^{-5} mol $dm^{-3}\,\sec^{-1}$. The reaction obeys

A. first order

B. zero order

C. second order

D. half order

Answer:

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84. The unit of rate constant and that of rate of reaction are same for

A. first order

B. zero order

C. second order

D. all are wrong

Answer:

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85. The correct expression for the the rate constant for reactions of zero order is

A. $k = [A_0]/2t$

B. $k = \frac{1}{t}\{[A_0] - [A]\}$

C. $k = \frac{1}{t}\{[A] - [A]_0\}$

D. $k = \frac{2.303}{t}\log\{[A_0] - [A]\}$

Answer:

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86. If a is the initial concentration then time required to decompose half of the substance for nth order is inversely proportional to:

A. a^n

B. a^{n-1}

C. a^{1-n}

D. a^{n-2}

Answer:

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87. The decomposition of NH_3 on the surface of finely divided platinum as catalyst

A. is always a zero order rection

B. is zero order at high concentration but 1st order at low concentrations

C. is first order at low concentration but zero order at high concentration

D. is always a first order reaction

Answer:

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88. For a given reaction half life period was found to be directly proportional to the initial concentration of the reactant. The order is

A. zero

B. 1

C. 2

D. 3

Answer:

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89. If 'a' is the initial concentration of the reactant, the time taken for completion of the reaction, if it is of zero order, will be

A. $\frac{a}{k}$

B. $\frac{a}{2k}$

C. $\frac{2a}{k}$

D. $\frac{k}{a}$

Answer:

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90. The reaction, $2A \rightarrow B + C$ follows zero order kinetics. The differential rate equation for the reaction is

A. $\frac{dx}{dt} = k[A]^0$

B. $\frac{dx}{dt} = k[A]^2$

C. $\frac{dx}{dt} = k[B][C]$

D. $\frac{dx}{dt} = k[A]$

Answer:

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91. Half life period of a zero order reaction is

A. proportional to initial concentration of reactants

B. independent of initial concentration of reactants

C. inversely proportional to initial concentrations of reactants

D. incersely proportional to the square of initial concentration of reactants

Answer:

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92. If order of reaction $A + B \xrightarrow{hv} AB$ is zero. It means that

A. rate of reaction is dependent of the concentration of the reacting species

B. rate of reaction is independent of the concentration of the reacting species

C. the rate of formation of activated complex is zero

D. rate of decomposition of activated complex is zero

Answer:

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93. The rate of a certain reaction $\left(-\frac{dc}{dt}\right)$ at different times are as follows

Time	Rate (moles litre^{-1} sec^{-1})
0	2.8×10^{-2}
10	2.78×10^{-2}
20	2.81×10^{-2}
30	2.79×10^{-2}

The reaction is

A. 1^{st} order

B. 2^{nd} order

C. 0 order

D. 3^{rd} order

Answer:

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94. A zero order reaction is one whose rate is independent of

A. the temperature of the reaction

B. the concentration of the reactants

C. the concentration of the products

D. the material of the vessel in which the reaction is carried out

Answer:

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95. The rate of a certain reaction at different time intervals are

The order of the reaction is

A. zero

B. first

C. second order

D. third order

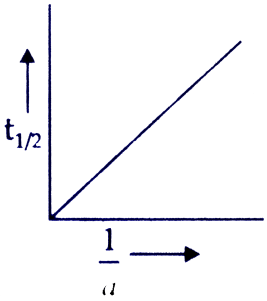
Answer:

View Text Solution

96. Which of the following graphs formed plotted between $t_{1/2}$ and initial concentration (a) represents a zero order reaction ?

A. 

B. 

C. 

D. 

Answer:

Watch Video Solution

97. Radioactive decay follows... order kinetics

A. zero

B. I

C. II

D. III

Answer:

View Text Solution

98. The decomposition of N_2O_5 occurs as, $2N_2O_5 \rightarrow 4NO_2 + O_2$, and follows I order kinetics, The true statement is

A. $k = \frac{[A]_o - [A]_t}{t}$

B. the reaction is unimolecular

C. $t_{1/2} \propto [A]_o^o$

D. $t_{1/2} \propto [A]_o^2$

Answer:

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99. Which one of the following formulae represents the first order reaction ?

A. $k = \frac{2.303}{t} \frac{\log([A])}{[A]_0}$

B. $k = \frac{2.303}{t} \frac{\log(a-x)}{a}$

C. $[A] = [A_0]e^{-kt}$

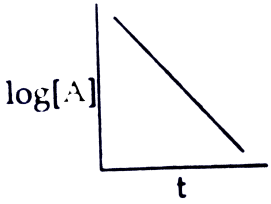
D. $k = \frac{2.303}{t} \frac{\log(a)}{a+x}$

Answer:

View Text Solution

100. For the first order reaction $A \rightarrow$ Products, which one of the following is the correct plot of log[A] versus time?

A. 

B. 

C. 

D. 

Answer:

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101. For the first order gas phase decomposition reaction,

$A(g) \rightarrow B(g) + C(g)$

if P_0 is the initial pressure of A and P_t is total pressure after time t, then

A. $k = \frac{2.303}{t} \frac{\log(P_0)}{P_t}$

B. $k = \frac{2.303}{t} \frac{\log(P_0)}{P_t - P_0}$

C. $k = \frac{2.303}{t} \frac{\log(P_0)}{P_t - 2P_0}$

D. $k = \frac{2.303}{t} \frac{\log(P_0)}{2P_0 - P_t}$

Answer:

View Text Solution

102. Which of the following is a first order reaction ?

A. $2H_2O_2(aq) \xrightarrow{pt} 2H_2O + O_2(g)$

B. $2HI \rightarrow H_2 + I_2$

C. $2NO_2 \rightarrow 2NO + O_2$

D. $2NO + O_2 \rightarrow 2NO_2$

Answer:

View Text Solution

103. The accompanying figure depicts the change in concentration of species x and Y for the reaction $X \rightarrow Y$, as a function of time. The point of intersection of the two curves represents

A. $t_{1/2}$

B. $t_{3/4}$

C. $t_{2/3}$

D. date in sufficient to predict

Answer:

View Text Solution

104. The half-life for a reaction is ..... of temperature:

A. independent

B. increased with increase

C. decreased with increase

D. dependent

Answer:

Watch Video Solution

105. The acid hydrolysis of ester is

A. I order reaction

B. bimolecular reaction

C. pseudo unimolecular reaction

D. all

Answer:

View Text Solution

106. A reaction is a first order when

A. the amount of product formed increases linearly with time

B. the amount of product formed increases linearly with time

C. the rate is Jinearly related to the concentration of the reactant

D. the concentration of the reactant decreases linearly with time

Answer:

View Text Solution

107. The reaction

$$CH_3COOC_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH$$

A. bimolecular reaction

B. II order reaction

C. both 'a' and 'b'

D. pseudo unimolecular reaction

Answer:

View Text Solution

108. A substance with initial concentration 'a' follows zero order kinetics. In how much time, will the reactions go to completion ?

A. a/k

B. 2/ka

C. k/a

D. 2k/a

Answer:

Watch Video Solution

109. The hydrolysis of ethyl acetat

$$CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$$

is a reaction of

A. first order

B. second order

C. third order

D. zero order

Answer:

View Text Solution

110. Which order of reaction obeys the relation

$t_{1/2} = 1/k$?

A. first

B. second

C. third

D. zero

Answer:

View Text Solution

111. A plot of log (a-x) against time 't' is a straight line. This indicates that the reaction is of :

A. second order

B. first order

C. third order

D. zero order

Answer:

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112. For the half-life period of a first order reaction, which one of the following statements is generally false?

A. It is independent of initial concentration

B. It is independent of temperature

C. It decreases with the introduction of a catalyst

D. It decreases with increases of temperature

Answer:

View Text Solution

113. A graph ploted between concetration of reaction consumed at any time (x) and $t_{1/2}$ is found to be a straight line passing throught the origin. Thus reaction is of

A. first order

B. zero order

C. third order

D. second order

Answer:

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114. The rate of a reaction $2X + Y \rightarrow$ Products is given by $\frac{d[Y]}{dt} = k[X]^2[Y]$

if X is present in large excess, the order of the reaction is

A. zero

B. two

C. one

D. three

Answer:

View Text Solution

115. The rate constant of a reaction is equal to rate of reaction

A. when oncentrations of reactants do not change with time

B. when concentrations of all reactants and products are equal

C. at time, t = 0

D. when oncentrations of all reactants are unity

Answer:

View Text Solution

116. The rate of reaction between A and B increases by a factor of 100 when the concentration of A is changed from 0.1 mol L^{-1} to 1 mol L^{-1}. The order of reaction with respect to A is :

A. 10

B. 1

C. 3

D. 2

Answer:

View Text Solution

117. For the reaction $A \rightarrow B$, the rate law expression is rate $= k[A]$. Which of the following statements is incorrect ?

A. The reaction follows first order kinetics

B. The $t_{1/2}$ of reaction depends on initial concentration of reactants

C. k is constant for the reaction at a constant temperature

D. The rate law provides a simple way of predicting the cone. of reactants and products at any time after the start of the reaction.

Answer:

Watch Video Solution

118. In the decomposition of N_2O_5, the rate of reaction is $-\frac{d[N_2O_5]}{dt} = k[N_2O_5]$.

For determination of the units of k,

A. Units of time are required

B. Units of concentration are required

C. Units of both time and concentration are required

D. None of these

Answer:

View Text Solution

119. If the concentration units are reduced by n times, then the value of rate constant of first order will

A. increase by n times

B. decrease by factor of n

C. not change

D. none

Answer:

View Text Solution

120. Which of the following is a first order reaction ?

A. $NH_4NO_2 \rightarrow N_2 + 2H_2O$

B. $2HI \rightarrow H_2 + I_2$

C. $2NO_2 \rightarrow NO + O_2$

D. $2NO_2 + O_2 \rightarrow 2NO_2$

Answer:

Watch Video Solution

121. The hydrolysis of ethyl acetate,

$R - COOR^1 + H_2O \xrightarrow{H^+} RCOOH + R^1 - OH$ is

A. first order

B. second order

C. third order

D. zero order

Answer:

View Text Solution

122. which of the following represents the expression for $3/4$th life of first order reaction?

A. $\frac{k}{2.303}\log.\ \frac{4}{3}$

B. $\frac{2.303}{k}\log.\ \frac{3}{4}$

C. $\frac{2.303}{k}\log.\ 4$

D. $\frac{2.303}{k}\log 3$

Answer:

Watch Video Solution

123. In the reaction of $aA + bB + cC \rightarrow$ Products,

i) if concentration of A is doubled, keeping cone. of B and C constant, the rate of reaction becomes double

ii) if concentration of Bis halved keeping cone. of A and C constant, the rate of reaction remains unaffected

iii) if concentration of C is made 1.5 times, the rate of reaction becomes 2.25 times. The order of reaction is

A. 1

B. 2.5

C. 3

D. 3.5

Answer:

View Text Solution

124. In the presence of acid, the initial concentration of cane sugar was reduced from 0.2 M to 0.1 M in 5 h and to 0.05 M in 10 h. The reaction must be of

A. zero order

B. first order

C. second order

D. fractional order

Answer:

Watch Video Solution

125. The rate law for the reaction

$RCl + NaOH(aq) \rightarrow ROH + NaCl$ is given by

Rate $= k[RCl]$. The rate of the reaction will be

A. doubled on doubling the concentration of NaOH

B. halved on reducing the concentration of RCl to half

C. decreased on increasing the tempearature of the reaction

D. unaffected by increasing the temperature of the reaction

Answer:

Watch Video Solution

126. The rate law of the reaction $A + 2B \rightarrow$ Product is given by $\frac{d(\text{Product})}{dt} = k[A]^2[B]$. A is taken in large excess, the order of the reqaction will be

A. zero

B. 1

C. 2

D. 3

Answer:

Watch Video Solution

127. The rate of the elementary reaction,

$2NO + O_2 \rightarrow 2NO_2$, when the volume of the reaction vessel is doubled:

A. will grow eight times of its initial rate

B. reduce to one- eight of ils initial rate

C. will grow four times of its initial rate

D. reduce to one-fourth of its initial rate

Answer:

Watch Video Solution

128. The half-life period of a first order reaction is given by

A. $t_{1/2} = \frac{0.693}{k}$

B. $t_{1/2} = \frac{k}{0.693}$

C. $t_{1/2} = 2.303 \text{ In } 2$

D. $t_{1/2} = 2.303\left(\frac{a}{2}\right)$

Answer:

View Text Solution

129. When the concentration of a reactant in reaction $A \rightarrow B$ is increased by 8 times but rate increases only 2 times, the order of the reaction would be

A. 2

B. $\frac{1}{3}$

C. 3

D. $\frac{1}{2}$

Answer:

Watch Video Solution

130. For the hydrolysis of esters in alkaline medium rate expression is, $-\frac{d[\text{Ester}]}{dt} = k[\text{ Ester}][\text{Alkali}]$.

Inspace alkali used is in excess, then the overall order of the reaction is

A. zero

B. first

C. same

D. third

Answer:

View Text Solution

131. The half-life period of a first order reaction is

A. directly proportional to the initial concentration a

B. inversely proportional to a

C. independent of a

D. independent of the rate constant of the reaction

Answer: C

View Text Solution

132. For the elementary step

$$(CH_3)_3CBr_{(aq)} \rightarrow (CH_3)_3C^+_{(aq)} + Br^-_{(aq)}$$

the molecularity is

A. zero

B. 1

C. 2

D. connot ascertained

Answer:

View Text Solution

133. Which of the following is an acceptable value of molecularity ?

A. $4/3$

B. 0

C. $1/2$

D. $2/2$

Answer:

View Text Solution

134. In the reaction 2A + B $\rightarrow$ Products, the order w.r.t. A is found to be one and w.r.t. B equal to 2. Concentration of A is doubled and that of B is halved, the rate of reaction will be

A. doubled

B. halved

C. remain unaffected

D. four times

Answer:

View Text Solution

135. The given hypothetical reaction is

$A \xrightarrow{I} B \xrightarrow{II} C \overset{III}{D} \xrightarrow{IV} E$ and date as

rate determining step is

A. Step I

B. Step II

C. Step III

D. Step IV

Answer:

View Text Solution

136. Which studying the decomposition of gaseous N_2O_5, it is observed that a plot of logarithm of its partial pressure versus time is linear. The kinetic parameter obtained from this observation is

A. specific reaction rate

B. reaction rate

C. energy of activation

D. molecularity

Answer:

View Text Solution

137. If the rate expresson for a chemical reaction is Rate $= k[A][B]^n$ then

A. the order of reaction is 1

B. the order of reaction reaction is n

C. the order of reaction is (1 + n)

D. k is independent of temearature

Answer:

View Text Solution

138. If the rate of reaction between A and B is given by rate $= k[A][B]^2$, then the reaction is :

A. first order in A

B. second order in B

C. third order overall

D. all are correct

Answer:

Watch Video Solution

139. Diazonium salt decomposes as

$C_6H_5N_2^+Cl^- \rightarrow C_6H_5Cl + N_2$. At $0^\circ C$, the evolution of N_2 becomes two times faster when the initial concentration of the salt is doubled. Therefore, it is

A. a first order reaction

B. a second order reaction

C. independent of the initial concentration of the salt

D. a zero order reaction

Answer:

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140. The following equation for the rate constant indicates that the reaction is of

$$k = \frac{2.303}{t} \log. \frac{a}{(a-x)}$$

A. second order

B. first order

C. third order

D. zero order

Answer:

View Text Solution

141. For the reaction $A \rightarrow B$, the rate law expression is rate $= k[A]$. Which of the following statements is incorrect ?

A. The reaction follows first order kinetics

B. the $t_{1/2}$ of reaction depends upon initial concentration of reactant

C. k is constant for the reaction at a constan temperature

D. the rate law provides a simple -way of predicting the concentration of reactants and products at any time after the start of the reaction

Answer:

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142. According to the Arrhenius equation a straight line is to be obtained by plotting the logarithm of the rate constant of a chemical reaction $(\log k)$ against

A. $\frac{1}{C}$

B. log C

C. C

D. log. $\frac{1}{C}$

Answer:

Watch Video Solution

143. For the reaction

$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$

which of the following graph would yield a straight line.

A. $\log p_{N_2O_5}$ vs time with -ve slope

B. $\log p_{N_2O_5}$ vs time the +ve slope

C. $(p_{N_2O_5})^{-1}$ vs time

D. $p_{N_2O_5}$ vs time

Answer:

View Text Solution

144. The inversion of cane sugar into glucose and frucose is :

A. I order

B. II order

C. III order

D. zero order

Answer:

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145. The number of molecules of the reactants taking part in a single step of the reaction tells about. :

A. molecularity of the reaction

B. mechanism of the reaction

C. order of reaction

D. all

Answer:

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146. For a reaction $A \rightarrow B$, the rate of reaction quadrupled when the concentration of A is doubled. The rate expression of the reaction is $r = K[A]^n$ when the value of n is

A. 1

B. zero

C. 3

D. 2

Answer:

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147. A reaction $A_2 + B_2 \rightarrow 2AB$ occurs by the following mechanism:

$A_2 \rightarrow A + A$... (slow)

$A + B_2 \rightarrow AB + B$... (fast)

$A + B \rightarrow AB$ ... (fast)

Its order would be

A. $\frac{3}{2}$

B. 1

C. zero

D. 2

Answer:

Watch Video Solution

148. If the first order reaction involves gaseous reactants and gaseous products the units of its rate are

A. atm

B. atm sec

C. atm $\sec^{-1}$

D. $atm^2 \sec^2$

Answer:

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149. In the reaction $2NO + Cl_2 \rightarrow 2NOCl$, it has been found that doubling the concentration of both the reactants increases the rate by a factor of eight but doubling the chlorine concentration alone only doubles the rate. Which of the following statements is incorrect?

A. The reaction is first order in Cl_2

B. The reaction is second order in NO

C. The overall order of reaction is 2

D. The overall order of reaction is 3.

Answer:

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150. Which of the following reactions can be kinetically studied under nomal laboratory conditions ?

A. $NaOH + HCl \rightarrow NaCl + H_2O$

B. $AgNO_3 + HCl \rightarrow KNO_3 + AgCl$

C. $2N_2O_5 \rightarrow 4NO_2 + O_2$

D. all of the above

Answer:

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151. The differential rate law of a reaction is given by, $\frac{dx}{dt} = k[A]^{1.5}[B]^{-0.5}$. The overall order of the reaction is ?

A. 0.3

B. 1.5

C. 1

D. 2

Answer:

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152. The half-life of a first order reaction $\left[k = \frac{2.303}{t}\log\left(\frac{a}{a-x}\right)\right]$ is

A. directly proportional to 'a'

B. inversely proportional to 'a'

C. independent of 'a'

D. proportional to (a - x)

Answer:

View Text Solution

153. The incorrect order indicated against the rate of reaction , $aA + bB \xrightarrow{h} C$ then

A. $-\frac{d[A]}{dt} = \frac{a}{b} \times \frac{d[B]}{dt}$

B. $-\frac{d[A]}{dt} = \frac{b}{a} \times \frac{d[B]}{dt}$

C. $-\frac{d[A]}{dt} = -\frac{1}{2}\frac{d[B]}{dt} = +\frac{d[C]}{dt}$

D. $-\frac{d[A]}{dt} = -\frac{b}{a} \times \frac{d[B]}{dt} = -\frac{b}{a} \times \frac{d[B]}{dt}$

Answer:

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154. For the reaction $H_{2(g)} + Br_{2(g)}$, the rate law is rate, $= K[H_2][Br_2]^{1/2}$. Which of the following statements is true about this rection ?

A. the raction is second order one

B. molecularity of the raction is m+ n

C. both a and b

D. none of corrcet

Answer:

View Text Solution

155. For raction : $mA + nB \rightarrow pC + qD$ the rate law given by

$$\frac{dx}{dt} = K[A]^x[B]^y$$

The correct statement for this raction if

A. the molecularityh of the raction is m+n

B. the overall order of the raction is m + n

C. both are correct

D. none of corrcet

Answer:

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156. Flase statement is

A. rate of zero order raction is independent of initial concentration of ration is inversely concentration of the reactant

B. half life of a third order reaction is inversetly proportional to the square of intial concentration of the reactant

C. for a first order raction $t_{1/2} = \frac{0.693}{k}$

D. molecularity of a raction may be zero negative or even fractional

Answer:

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157. For first order raction, the concentration of ractant

A. is independent of time

B. varies linearly with time

C. varies exponentially with time

D. none

Answer:

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158. The rate constant of raction is 0.2 $\min^{-1}$. The order of the reaction is

A. second

B. first

C. zero

D. third

Answer:

View Text Solution

159. $2N_2O_5 \rightarrow 4NO_2 + O_2$

If $-\frac{D[N_2O_5]}{dt} = k_1[N_2O_5]$

$\frac{d[NO_2]}{dt} = k_2[N_2O_5]$

$\frac{[O_2]}{dt} = k_3[N_2O_5]$

What is the relation between k_1, k_2 and k_3 ?.

A. $k_2 = 2k_1 \text{and} k_3 = \frac{1}{2}k_1$

B. $k_1 = 2k_1 \quad \text{and} \quad k_3 = 2k_1$

C. $k_1 = k_2 = k_3$

D. $k_1 = 2k_2 = 3k_2$

Answer:

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160. If a is the initial concentration of the reaction and $t_{1/2}$ is the half change time. Which of the following in true of the n^{th} order reaction

A. $t_{1/2} \propto a^{n-1}$

B. $t_{1/2} \propto a^{n}$

C. $t_{1/2} \propto a^{1-n}$

D. $t_{1/2} \propto a^{n+1}$

Answer:

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161. The rate of the reation is expressed in different way as followed :

$$-\frac{1}{m}.\frac{d[A]}{dt}=+\frac{1}{n}\frac{d[B]}{dt}=-\frac{1}{p}\frac{d[C]}{dt}=+\frac{1}{q}\frac{d[D]}{dt}$$

The reaction is

A. $na+mB\rightarrow pC+qD$

B. $pA+qB\rightarrow mC+nD$

C. $pA+mB\rightarrow nC+qD$

D. $mA+pC\rightarrow nB+qD$

Answer:

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162. The half -life of a first order reaction $\left[k = \frac{2.303}{t}\log\left(\frac{a}{a-x}\right)\right]$ is

A. directly proportional to a

B. inversely proportional to 'a'

C. independent

D. proportional to (a - x)

Answer:

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163. The reaction , $X + 2Y + Z \rightarrow N$ occurs by the following mechanism

(i) $X + Y \Leftrightarrow M$ (very rapid equilibrium)

(ii) $M + Z \rightarrow O$ (slow)

(iii) $O + Y \rightarrow N$ (very fast)

What is the rate law for this reaction

A. $k[C]$

B. $k[A][B]^2[C]$

C. $k[Z]$

D. $k[x][Y][Z]$

Answer:

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164. When a plot of log k versus $1/T$ of chemical reaction is made, the energy of activation is given by the slope of straight line

A. obtained

B. multiplied by + 2.303 R

C. multipiled by -2.303 R

D. divided by +2.303 R

Answer:

View Text Solution

165. For a first order reaction, the reaction, the plot of $\log C$ against 't' (log C vs 't') gives a straight line with slope equal to:

A. $-\frac{k}{2.303}$

B. $\frac{2.303}{\log k}$

C. $-\frac{2.303}{k}$

D. $+\frac{2.303}{\log k}$

Answer:

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166. For a general chemical change $2A + 3B \rightarrow$ Products, the rates with respect to A is r_1 and that with respect to B is r_2 The rates r_1 and r_2 are related as

A. $3r_1 = 2r_2$

B. $r_1 = r_2$

C. $2r_1 = 3r_2$

D. $r_1^2 = 3r_2$

Answer:

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167. A reaction is represented by $A \xrightarrow{k_1} B$ (slow) and $A + B \xrightarrow{k_2} C$ (fast) where k_1 and k_2 are the ratge constants of two steps. The rate of production of C will be given by

A. $k_1[A][B]$

B. $k_1[A]$

C. $k_1k_2[A]$

D. $k_2[A][B]$

Answer:

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168. In several experiments on the kinetics of reaction $A + B \rightarrow$ Products, it is observed that

i) On doubling the initial concentration of A, the rate was increased by four times and

ii) On doubling the initial concentration of B, the rate was increased by two times.The correct statement is

A. the reaction is first order in and second order in B

B. the reaction is first order in both the reactants

C. the rate equation is $\frac{dx}{dt} = k[A]^0[B]$

D. the over all order of the reaction is three

Answer:

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169. For the reaction, $A + 2B + C \rightarrow D + 2E$, the rate of formation of D is found to be

i) doubled when [A] is doubled keeping [B] and [C] constant

ii) doubled when [C] is doubled keeping [A] and [B] constant

iii) the same when [B] is doubled keeping [A] adn [C] constant.

Which one is the rate equation for the reaction

A. rate $= k[A][B][C]$

B. rate $= k[A]^0[B][C]$

C. rate $= k[A][B]^0[C]$

D. rate $= [A][B][C]^0$

Answer:

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170. The hydrolysis of methyl formate in acid solution has rate expression, rete $= k[HCOOCH_3][H]^+$ the balanced equation being,

$HCOOCH_3 + H_2O \rightarrow HCOOH + CH_3OH.$

The rate law contains $\left[H^+\right]$ though the balanced equation does not ontain $\left[H^+\right]$ because

A. of convenience to express the rate law

B. H^+ ion is a catalyst

C. H^+ is an important constituent of any reaction all acids contains H^+ ions

D. all acids contains H^+ ions

Answer:

View Text Solution

171. For an endothermic reaction, where ΔH represents the enthalpy of reaction in $kJmol^{-1}$, the minimum value for the energy of activation will be

A. less than ΔH

B. zero

C. more than ΔH

D. equal to ΔH

Answer:

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172. Th Arrhenius equation expressing the effect of temperature on the rate constant of the reaction is

A. $k = \frac{E_a}{RT}$

B. $k = Ae^{-E_a/RT}$

C. $k = Ae^{E_a/RT}$

D. $k = e^{-E_a/RT}$

Answer:

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173. The minimum amount of energy required for the reacting molecules to undergo reaction is called :

A. threshold energy

B. activation energy

C. internal energy

D. potential energy

Answer:

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174. If E_f and E_r are the activation energies of forward and backward reactions and the reaction is known to be exothermic, then

A. $E_f < E_r$

B. $E_f > E_r$

C. $E_f = E_r$

D. No relation can be given between E_f and E_r as date are not sufficient .

Answer:

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175. Two reactions $A \rightarrow$ products and $B \rightarrow$ products have rate constants K_A and k_B at temperature, T and activation energies E_A and E_B respectively. If $k_A < k_B$ and assuming that A for both the reaction is same then

A. at lower temperature k_A will be greater than k_B

B. at lower temperature k_A and k_B will differ more and $k_A > k_B$

C. as temperature rises k_A and $k_B$will be close to each other inmagnitude

D. all

Answer:

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176. Combustion of carbon is exothermic, but coal stored in coal depots does not burn automatically because of:

A. high threshold energy barrier

B. kinetic stability of coal

C. higher energy of activation needed for burning

D. all

Answer:

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177. Increase in the concentration of the reactants leads to the changes in

A. heat of reaction

B. activation energy

C. collision frequency

D. threshold energy

Answer:

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178. According to collision theory of reaction rates

A. every collision between reactans leads to chemical reaction

B. rate of reaction is proportional to velocity of molecules

C. all reactions which occur in gaseous phase are zero order reactions

D. rate of reaction is directly proportional to collision frequency

Answer: D

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179. Which statement is not correct?

A. for endothermic reactions, heat of reaction is lesser than energy of activation

B. for exothermic reactions, heat of reaction is more than energy of activation

C. for exothermic reactions energy of activations is less in forward reaction than in backward reaction

D. for endothermic reactions energy of activation is more in forward reaction than in backward reaction

Answer:

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180. The Activation energy for a chemical reaction mainly depends upon

A. temperature

B. nature of reacting species

C. collision frequency

D. concentration of reactants.

Answer:

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181. For an exothermic reaqction, the energy of activation of the reactants is

A. equal to the ertergy of activation of products

B. less than the energy of activation of products

C. greater than the energy of activation of products

D. sometimes greater and sometimes Jess than that of the products

Answer:

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182. The rate of reaction increases with increase of temperature because a

A. activation energy barrier is lowered

B. the average energy of the products increases

C. threshold energy changes

D. activation energy is lowered

Answer:

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183. The enzyme-catalyzed reaction is faster than a metal catalyzed reaction because

A. its activation energy is greater

B. its activation energy is lower

C. enzymes are present in larger amounts

D. none of the above

Answer:

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184. Which statement is correct ?

A. reactions with low activation energy are usually exothermic

B. the rate Jaw soetimes enables to deduce the mechanism of a reaction

C. the rate Jaw for a reaction is an algebric expression relating the forward reaction rate to product concentration

D. increase in the total pressure of a gas phase reaction increases the fraction of collisions effective in producing reactions

Answer:

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185. For the reaction, for which the activation energies for forward and backward reactions are same, then:

A. $\Delta H = 0$

B. $\Delta S = 0$

C. the order is zero

D. there is no catalyst

Answer:

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186. The chemical reactions in which reactants require high amount of activation energy are genera11y

A. slow

B. fast

C. instantaneous

D. spontaneous

Answer:

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187. The presence of a catalyst

A. increases the heat of reaction

B. decreases the heat of reaction

C. has no effect on the heat of reaction

D. has no effect on the energy of activation

Answer:

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188. The rate constant K_1 of a reaction is found to be double that of rate constant K_2 of another reaction. The relationship between corresponding activation energies of the two reaction at same temperature $(E_1 \text{and} E_2)$ can be represented as:

A. $E_1 > E_2$

B. $E_1 < E_2$

C. $E_1 = E_2$

D. none

Answer:

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189. Energy of activation of an exothermic reaction reaction is _____.

A. zero

B. negative

C. positive

D. can't be predicted

Answer:

Watch Video Solution

190. Which of the following statement about the catalyst is/are true?

A. A catalyst accelerates the rate of reaction by bringing down the energy of activation

B. A catalyst does not participate in reaction mechanism

C. A catalyst'makes the reaction more feasible by making ΔG more negative

D. A catalyst makes equilibrium constant more favourable for forward reaction

Answer:

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191. Activation energy of the reaction is :

A. the energy released during the reaction

B. the energy evolved when activated complex is formed

C. minimum amount of energy needed to overcome the potentia] barrier ,of reaction

D. the energy needed to form one mole of the product

Answer:

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192. According to collision thery

A. collisions are sufficiently violent

B. all collisions are responsible for reaction

C. all collisions are effective

D. only highly energetic molecules have enough energy to react

Answer:

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193. Which one of the following statements is incorrect?

A. The temperature coefficient of a reaction is the ratio of the rate constants at any two temperatures

B. The temperature coefficient of a reaction is the ratio of the rate constants at 298 K and 308 K

C. The temperature coefficient of most of the reactions lies between 2 and 3

D. In an endothermic reaction, activation energy of reactants is more than that of the products

Answer:

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194. The rate constant (K') of one reaction is double of the rate constant (K") of another reaction. Then the relationship between the corresponding activation energies of the two reactions $\left(E_a' \text{and} E_a''\right)$ will be

A. $E_a' > e_a''$

B. $E_a' < E_a''$

C. $e_a' = E_a''$

D. $E_a' = 4E_a''$

Answer:

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195. An endothermic reaction A $\rightarrow$ B has an activation energy as $\times$ kJ $mo1^{-1}$ of A. If energy change of the reaction is y kJ, the activation energy of the reverse reaction is :

A. $-x$

B. x - y

C. x + y

D. y - x

Answer:

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196. The effect of temperature on reaction rate is given by

A. Arrhenius equation

B. Gibbs Helmholtz equation

C. Kirchhoff's equation

D. none

Answer:

Watch Video Solution

197. At room temperature, the reaction between NO and O_2 to give NO_2 is fast, while that between CO and O_2 is slow. It is due to:

A. CO is smallar in size than of NO

B. Co is poisonous

C. the activation energy for the reaction,

$2NO + O_2 \rightarrow 2NO_2$ is less then

$2CO + O_2 \rightarrow 2CO_2$

D. none

Answer:

Watch Video Solution

198. A large increase in the rate of a reaction for a rise in temperature is due to

A. an increase in the number of collisions

B. an increase in the number of activated molecules

C. lowering of threshold energy

D. shortening of mean free path

Answer:

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199. The rates of reaction invrease with increase of temperature because

A. activation energy of the reaction molecules decreases

B. kinetic eriergy of the product molecules increases

C. the fraction of the reacting molecules possessing an energy equal to the activation energy

D. the collisions between molecules decrease

Answer:

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200. The activation energy of reaction is equal to

A. threshold energy for the reaction

B. threshold energy + energy of the reactants

C. threshold energy - energy of the reactants

D. threshold energy+ energy of the products

Answer:

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201. Collision theory is most satisfactory for

A. first order reaction

B. second order reaction

C. bimolecular reaction

D. any order reaction

Answer:

View Text Solution

202. The rate of chemical reaction is doubled for every $10^{\circ}C$ rise in temperature because of

A. decrease in the activation energy

B. decrease in the threshold energy

C. increase in the number of molecular collisions

D. increase in the number of activated molecules

Answer:

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203. The reactions $2NO + O_2 \rightarrow 2NO_2$

$2CO + O_2 \rightarrow 2CO_2$

look to be identical, yet the first is faster than the second. The reason is that

A. the first reaction has lower enthalpy change than the second

B. the first reaction has lower internal energy change than the second

C. the first reaction has lower activation energy than the second

D. the first reaction has lower activation energy than the second.

Answer:

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204. Which of the following expresisons give the effect of temperature on the rate constant?

A. In k = l n $A - E_a / RT$

B. In k = ln $A + E_a / RT$

C. $k = A - E_a / RT$

D. $k = InA + InE_a / RT$

Answer:

Watch Video Solution

205. The rate of reaction is doubled for $10^\circ C$ rise in temperature. The increase in the reaction rate as a result of temperature rise from $10^\circ C$ to $100^\circ C$ is

A. 112

B. 512

C. 400

D. 614

Answer:

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206. The minimum energy required for molecules to enter into chemical reaction is called

A. kinetic energy

B. potential energy

C. threshold energy

D. activation energy

Answer:

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207. According to collision theory, collision rate = Z (reactants), where Z is

A. Activation energy

B. Packing frequency

C. Collision frequency

D. Potential energy

Answer:

Watch Video Solution

208. The correct expression for Arrhenius equation showing the effect of temperature on the rate constant is

A. $\frac{k_2}{k_1} = \frac{E_a}{2.303R}\left(\frac{T_2 - T_1}{T_2 T_2}\right)$

B. $In\frac{k_2}{k_1} = \frac{E_a}{R}\left(\frac{1}{T_1} - \frac{1}{T_2}\right)$

C. $k = Ae^{E_a / RT}$

D. $\log. \frac{K_2}{k_1} = \frac{E_a}{2.303}\left(\frac{T_1T_2}{T_2 - T_1}\right)$

Answer:

Watch Video Solution

209. At a given temperature, the energy of activation of two reaction is same if

A. The specific rate constant for the two reactions is the same

B. the temperature coefficient for the specific rate constant for the two reactions is the same

C. ΔH from the two reactions is the same but not zero

D. ΔH for the two reactions is zero

Answer:

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210. The plot og $\log k$ vs $1/T$ helps to calculate

A. energy of activation

B. rate constant of the reaction

C. order of the reaction

D. Pnergy of activation as well as the frequency ctor.

Answer:

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211. Point out the incorrect statement

A. rate law is an experimental value

B. law of mass action is a theoretical proposal

C. rate law is more informative than law of mass action for developing mechanism

D. rate law is always different from the e:gt.ltpression of law of mass action

Answer:

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212. The activation energies of the forward and backward reactions in the case of a chemical reaction are 30.5 and 45.5 KJ/mol , respectively . The reaction is:

A. exothermic

B. endothermic

C. neither exothermic nor endothermic

D. independent of temperature

Answer:

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213. In a certain reaction, 10% of the reactant decomposes in one hour, 20% in two hours, 30% in theee hours, and so on. The dimenison of the velocity constant (rate constant) are

A. hour^{-1}

B. $mollitre^{-1}\text{hour}^{-1}$

C. $litremol^{-1}\,\text{sec}^{-1}$

D. $mol\,\text{sec}^{-1}$

Answer:

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214. For the exothermic reaction, $A + B \rightarrow C + D$. ΔH is the heat of reaction and Ea is the activation energy. The activation energy for the formation of A + B will be

A. E_a

B. ΔH

C. $E_a + \Delta H$

D. $\Delta H - E_a$

Answer:

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215. While studying the decompoistion of gaseous N_2O_5, it is observed that a plot of logarithm of its partial pressure versus time is linear. What kinetic parameters can be obtained form this observation?

A. rate constant

B. initial concentration of N_2O_5

C. both

D. energy of activation

Answer:

Watch Video Solution

216. If /is the fraction of collisions withst1ffident K.E. and P is the fraction of collision::, with proper orientations of colloiding molecules then according to Arrhenius equation, rate constant of a chemical reaction is equal to

A. $P.\ fe^{-E_a/RT}$

B. $\frac{P}{f}e^{-E_a/RT}$

C. $P.\ f \times \frac{1}{E_a/RT}$

D. $P.\ Af \times e^{-E_a^2/RT}$

Answer:

View Text Solution

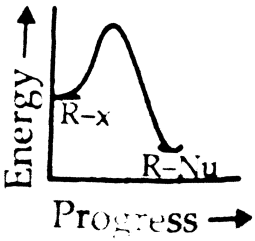
217. The following reaction is accompanied by liberation of heat and occurs in two steps as follows

i) $R - X \rightarrow R^+ + X^-$ (slow)

ii) $R^+ + Nu^- \rightarrow R - Nu$ (fast)

The progress of the reaction is best represented by

A.

B. 

C.

D.

Answer:

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218. An exothermic reaction A $\rightarrow$ B has an activation energy of X kJ mol^{-1} of A. If the energy change in the reaction is Y kJ, then the activation energy of the backward reaction will be

A. $-X$

B. Y-Y

C. Y-X

D. X + Y

Answer:

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219. For the reaction, for which the activation energies for forward and backward reactions are same, then:

A. the stoichiometry is the mechanism

B. ΔS (Entropy change)= O

C. $\Delta H = 0$

D. the order is zero

Answer:

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220. The rate constant is numerically the same for three reactions of first, second and third order respectively. Which of the following is correct ?

A. if [A]= 1 then $r_1 = r_2 = r_3$

B. if [A] lt 1 then $r_1 > r_2 > r_3$

C. if [A] gt 1 then $r_1 < r_2 < r_3$

D. all

Answer:

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221. Energy profile of the reaction A+ BC $\rightarrow$ AB +C is given in the figure

Which of the following statement is true ?

A. threshold energy of the reaction is 100 kJ

B. E_f is 60 Kj mol^{-1} while E_r is 40 kJ mol^{-1}

C. ΔH is + 20 kJ mol^{-1} and the reaction is endothermic

D. all are true

Answer:

View Text Solution

222. Given the energy profile for the reaction

$A + B \rightarrow C + D$

Pick up the correct statements

1) activation evergy for the reaction $C + D \rightarrow A + B$ is (x + y)

2) ΔH of the reaction $A + B \rightarrow C + D$ is -y

3) threshold energy of the reaction is x + y + z

A. 1 and 2

B. 2 and 3

C. 1 and 3

D. 1,2 and 3

Answer:

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223. Consider the following statement :

1 The rate of reaction is always proportinal to the concentration of reactants.

2 The order of an elementary chemical reaction step can be determined by examing its stoichimoetry.

3 The first order reactions follows an exponential time course.

Of these statements :

A. (i), (ii) and (iii) are correct

B. (i) and (ii) are correct

C. (ii) and (iii) are correct

D. (i) and (iii) are correct

Answer:

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224. Which one of the following is NOT correct for transition state theory

A. the reactants are first converted to an activated complex.

B. the activated complex remains in equilibrium with the reactants.

C. the activated complex has a transient existence.

D. the activated complex can be isolated.

Answer:

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225. The reaction $2Na + Cl_2 \rightarrow 2NaCl$ is found to follow III order kinetics. Its molecularity is

A. 1

B. 2

C. 3

D. 4

Answer:

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226. Which of the following statements is incorrect ?

A. Activation energy for the forward reaction equals that of reverse reaction.

B. For a reversible reaction, an increase in temperature increases the reaction rate for both the forward and the backward reaction

C. The larger the initial concentration for a second order reaction, the shorter its half life.

D. When Δt is infinitesimally small, the average rate equals the instantaneous rate

Answer:

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227. The hydrolysis of methyl formate in acid solution has rate expression :

rate $= k[HCOOCH_3]\left[H^+\right]$,

the balanced equation being

$HCOOCH_3 + H_2O \rightarrow HCOOH + CH_3OH$

The rate law contains $\left[H^+\right]$ though the balanced equation does not contain $\left[H^+\right]$ though the balanced equation does not contain $\left[H^+\right]$ because

A. more for convenience to express the rate law

B. H^+ ion is a catalyst

C. H^+ is an important constituent of any reaction

D. all acids contains H^+ ions

Answer:

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228. Which of the following statements is incorrect ?

A. The catalyst does not affect the equilibrium of a reaction.

B. Reaction with higher activation energy has higher rate constant.

C. In an exothermic reaction, the activation energy of the reverse reaction is higher than that of the forward reaction

D. Half-life period of a first order reaction is independent of initial concentration.

Answer:

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229. In a reaction, the rate expression is Rate $= k[A][B]^{2/3}$, the order of reaction is

A. 1

B. 2

C. $5/3$

D. zero

Answer:

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230. Which of the foliowing is a fast reaction ?

A. $H_2 + Cl_2 \rightarrow \xrightarrow{hv} 2HCl$

B. $NO_2 + CO \rightarrow NO + CO_2$

C. $CH_3CHO \rightarrow CH_4 + CO$

D. $6CO_2 + 6H_2O \xrightarrow{hv} C_6H_{12}O_6 + 6O_2$

Answer:

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231. Which sta.tement is correct?

A. Law of mass action and rate I.aw expressions re same for single step-reactions

B. Order of the slowest elementary reaction of a ~omplex reaction gives the order of 'the complex. reaction

C. Both order artq. molecularity have normally maximum value of 3

D. All

Answer:

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232. Rate expression of a chemical change is $\frac{dx}{dt} = k[A]^1[B]^{1/2}[C]^{3/2}$. The order of the reaction is

A. 2

B. 3

C. 1

D. zero

Answer:

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233. Therateofthereaction, $A + B + C \to P$ is given by, $r = -\frac{d[A]}{dt} = k[A]^{1/2}[B]^{1/2}[C]^{1/4}$. The order is

A. 1

B. 2

C. $1/2$

D. $5/4$

Answer:

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234. The plot of concentration of the reactant vs time for a reaction is a straight line with a negative slope. This reaction follows

A. first order rate equation

B. zero order rate equation

C. second order rate equation

D. third order rate equation

Answer:

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235. In the formation of sulphur trioxide by contact process, $2SO_2 + O_2 \rightarrow 2SO_3$, the rate of reaction was measured as $-\frac{d[O_2]}{dt} = 2.5 \times 10^{-4} molL^{\&}(-1)s^{-1}$

Rate of reaction expressed in terms of SO_3 will be

A. -5.0×10^{-4} mol $L^{-1}s^{-1}$

B. -1.25×10^{-4} mol $L^{-1}s^{-1}$

C. 2.5×10^{4} mol $L^{-1}s^{-1}$

D. 5.00×10^{-4} mol $L^{-1}s^{-1}$

Answer:

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236. On increasin g the tempearture by 10K in the case of slow reactions

A. number of collisions get doubled

B. value of rate constant increasex

C. energy of activation increases

D. none

Answer:

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237. A reaction proceeds in three stages. The first stage is a slow and involves two molecules of reactants. The second and third stage are fast. The overall order of the reaction is

A. first order

B. second order

C. third order

D. zero order

Answer:

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238. Which statement is correct ?

A. Molecularity of a reaction is same as the order of reaction

B. In some ·cases order of reacbon may be same as the molecularity of the reaction

C. Both 'a' and 'b' are correct

D. All are incorrect

Answer:

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239. Which of the following theory is not related to the chemical kinetics?

A. Collision theory

B. Activated complex theory

C. Absolute reaction rate theroy

D. VSEPR theory

Answer:

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240. Burning of coal is represented as $C(s) + O_2(g) \rightarrow CO_2(g)$. The rate of this reaction is increased by

A. decrease in the concentration of oxygen

B. powdering the lumps of coal

C. decreasing the temperature

D. proviqing inert atmosphere for burning

Answer:

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241. Among the following reaction, the fastest one is

A. burning of coal

B. rusting of iron in moist air

C. conversion of monoclinic sulphur to rhombic sulphur

D. Reaction between sodium nitrate and Hydrogen chloride solutions.

Answer:

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242. For a reaction k is $2.5 \times 10^{-3} \frac{1}{mol \times \sec}$.

The order of reaction is

A. half

B. one

C. two

D. three

Answer:

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243. The reaction between $H_{2(g)}$ and $ICI_{(g)}$ occurs in the following steps :

i) $H_2 + ICl \rightarrow HI + HCl$

ii) $HI + IC < oI_2 + HCl$

The reaction intermediate in the reaction is

A. HCl

B. ICl

C. I_2

D. HI

Answer:

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244. Which of the following rate laws has an overall order of 0.5 for reaction involving substances x, y and z ?

A. rate : $k_{C_x}^{-0.5}(C_y)^{0.5}(C_z)^{0.5}$

B. rate : $k(C_x)^{0.5}(C_y)^{0.5}(C_z)^{0.5}$

C. rate : $k(C_x)^{1.5}(C_y)^{-1}(C_z)^{0}$

D. rate : $k(C_x)(C_y)^{n}(C_z)^{2}$

Answer:

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245. Reaction between ethyl bromide and aqueous KOH follows which order kinetics

A. zero order

B. seond order

C. first order

D. none

Answer:

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246. Pieces of wood burn faster than a log of wood of the same mass because

A. log of wood has larger surfae area and needs more time to burn

B. wood shavings have larger surface area

C. all pieces of wood burn at the same rate

D. log of wood has higher density than wood shavings

Answer:

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247. For the reaction

$CH_3COCH_3 + I_2 \xrightarrow{H^+}$ products. The rate equation is, $\frac{dx}{dt} = k[CH_3COCH_3]\left[H^+\right]$. The order of the reaction with respect to iodine is

A. one

B. two

C. half

D. zero

Answer:

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248. For a chemical reaction $A_2 + 2B \rightarrow$ Products, the rate con trolling step is $A = \frac{1}{2}B \rightarrow C$. If the cone. of B is tripled, the rate of reaction will

A. remain the same

B. become four times

C. become 1.732 times

D. become double

Answer:

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249. Which rate expression suggests an over all order of 2.5 for the reaction involving substances X, Y, Z?

A. Rate $= k[X][Y][Z]^{2.5}$

B. Rate $= k[X]^{0.5}[Y]^{0.5}[Z]^{0.5}$

C. Rate $= k[X]^{1.5}[Y][Z]^{0}$

D. Rate $= k[X][Y]^{0}/[Z]^{2}$

Answer:

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250. The rate of reaction becomes 2 times for every $10^{\circ}C$ rise in temperature. How the rate of reaction will increase when temperature is increased from $30^{\circ}C$ to$80^{\circ}C$?

A. 16

B. 32

C. 64

D. 128

Answer:

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251. In the reaction $A + 2B \rightarrow C + 2O$ the initial rate $\frac{-d[A]}{dt}$ at $t = 0$was found to the $2.6 \times 10^{-2}\mathrm{M\,sec}^{-1}$. What is the value of $\frac{-d[B]}{dt}$ at $t = 0$ in ms^{-1} ?

A. 2.6×10^{-2}

B. 5.2×10^{-2}

C. 1.0×10^{-1}

D. 6.5×10^{-3}

Answer:

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252. A gaseous $A_2(g) \rightarrow B(g) + \frac{1}{2}C(g)$, shows increase in pressure from 100 mm to 120 mm in 5 min. The rate of disappearance of A_2 is

A. 4 mm min^{-1}

B. 8 mm min^{-1}

C. 16 mm min^{-1}

D. 2 mn min^{-1}

Answer:

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253. A drop of solution (volume $0.05mL$) contains $3 \times 10^{-6}\text{mole}H^{\oplus}$ ions. If the rate constant of disappearance of $H^{\oplus}$ ions is $1 \times 10^{7}molL^{-1}s^{-1}$, how long would it take for $H^{\oplus}$ ions in the drop of disappear?

A. $6 \times 10^{-8}\,\text{sec}$

B. $6 \times 10^{-7}\,\text{sec}$

C. $6 \times 10^{-9}\,\text{sec}$

D. $6 \times 10^{-10}\,\text{sec}$

Answer:

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254. For a chemical reaction $Y_2 + 2Z \rightarrow$ Product, rate conctrolling step is $Y + \frac{1}{2}Z \rightarrow Q$

If the concentration of Z is doubled, the rate of reaction will

A. remain the same

B. become four times

C. become $\sqrt{2}$ times

D. become double.

Answer:

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255. The rate of the reaction $N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$ was measured as

$\frac{1}{2}\frac{d}{dt}[NH_3] = 2 \times 10^{-4} molL^{-1}\sec^{-1}$

The rates of the reaction expressed in terms of N_2 and H_2 are

	Rates in term of N_2 $(molL^{-1}\sec^{-1})$	Rate in terms of H_2 $(molL^{-}\sec^{-1})$
A.	1×10^{-4}	1×10^{-4}
B.	3×10^{-4}	1×10^{-4}
C.	1×10^{-4}	1×10^{-4}
D.	2×10^{-4}	2×10^{-4}

Answer:

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256. The rate of a gaseous reaction $A + B \rightarrow C + D$ is equal to k [A][B]. The volume of the reaction vessel containing these gases is suddenly reduced to one-fourth of the initial volume . The rate of reaction would be

A. $1/16$

B. $16/1$

C. $1/8$

D. $8/1$

Answer:

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257. For a chemical reaction $2X + Y \rightarrow Z$, the rate of appearance of Z is $0.05 mol L^{-1} \min^{-1}$. The rate of diappearance of X will be

A. 0.05 mol L^{-1} per hour

B. 0.05 mol L^{-1} per min.

C. 0.1 mol L^{-1} $\min^{-1}$

D. 0.25 mol L^{-1} per min.

Answer:

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258. When ethyl acetate was hydrolysed in pressure of 0.1 N HCl, the rate constant was found to be $5.40 \times 10^{-5} \sec^{-1}$. But

when 0.1 N H_2SO_4 was used for hydrolysis, the rate constant was found to be `6.25 xx10^(-5)sec^(-1). Thus, it may be concluded that :

A. H_2SO_4 is stronger than HCl

B. H_2SO_4 is weaker than HCl

C. H_2SO_4 and HCl both have the same strength

D. the data are not sufficient to compare the strength of H_2SO_4 and HCl

Answer:

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259. Ethylene is produced by,

$$\underset{\text{Cyclobutane}}{C_4H_8} \xrightarrow{\Delta} 2C_2H_4$$

The rate constant is $2.48 \times 10^{-4} \sec^{-1}$. In what time will the molar ratio of the ethylene to cyclobutane in reaction mixture attain the value 1 ?

A. 27.25 minute

B. 28.25 minute

C. 25 minute

D. 20 minute

Answer:

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260. For the reaction $A + 2B \rightarrow 2C + D$, the concentration of A is kept constant and that of B is tripled, the rate of reaction will become

A. three times

B. six times

C. eight times

D. nine times

Answer:

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261. For the reaction $N_2 + 3H_2 \rightarrow 2NH_3$ the rate of change of concentration for hydrogen is $-0.3 \times 10^{-4} Ms^{-1}$. The rate of change of concentration of ammonia is

A. -0.2×10^{-4}

B. 0.2×10^{-4}

C. 0.1×10^{-4}

D. 0.3×10^{-4}

Answer:

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262. In a first order reaction the a/(a - x) was found tu be 8 after 10 minute. The rate constant is

A. $(2.303 \times 3 \log 2) / 10$

B. $(2.303 \times 21og3) / 10$

C. $10 \times 2.303 \times 2 \log 3$

D. $10 \times 2.303 \times 3 \log 2$

Answer:

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263. Two gases A and B are filled in a container. The experimental rate law for the reaction between them, has been found to be Rate $= k[A]^2[B]$Predict the effect on the rate of the reaction when pressure is doubled :

A. the rate is doubled

B. the rate becomes four times

C. the rate beomces six times

D. the rate becomes eight times

Answer:

View Text Solution

264. For the reaction, $N_2 + 3H_2 \rightarrow 2NH_3$ the rate $\frac{d[NH_3]}{dt} = 2 \times 10^{-4} Ms^{-1}$. Therefore the rate $-\frac{d[N_2]}{dt}$ is given as:

A. $10^{-4} Ms^{-1}$

B. $10^{4} Ms^{-1}$

C. $10^{-2} Ms^{-1}$

D. $10^{4} sM^{-1}$

Answer:

Watch Video Solution

265. The rate of a reaction gets doubled when the temperature changes from $7^{\circ} C$ to $17^{\circ} C$. By what factor will it change for

the temperature change from $17^{\circ} C$ to $27^{\circ} C$?

A. 1.81

B. 1.71

C. 1.91

D. 1.76

Answer:

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266. In hydrogenation reaction at $25^{\circ} C$, it is observed that hydrogen gas pressure falls from 2 atm to 1.2 atm isn 50 min. Calculate the rate of reaction in molarity per sec. (R=0.0821 litre -atm $\text{degree}^{-1} \text{mol}^{-1}$)

A. 1.09×10^{-6}

B. 1.09×10^{-5}

C. 1.09×10^{-7}

D. 1.09×10^{-8}

Answer:

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267. A gaseous $A_2(g) \rightarrow B(g) + \frac{1}{2}C(g)$, shows increase in pressure from 100 mm to 120 mm in 5 min. The rate of disappearance of A_2 is

A. 4

B. 8

C. 16

D. 2

Answer:

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

A. -1

B. -2

C. 2

D. 1

Answer:

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269. The reaction ,N_2O_5 in $2NO_2 + (1/2)O_2(g)$ is of first order for N_2O_5 with rate constant $6.2 \times 10^{-4}s^{-1}$. What is the value of rate of reaction when $[N_2O_5] = 1.25molL^{-1}$?

A. $5.15 \times 10^{-5}molL^{-1}s^{-1}$

B. $6.35 \times 10^{-3}molL^{-1}s^{-1}$

C. $7.75 \times 10^{-4}molL^{-1}s^{-1}$

D. $3.85 \times 10^{-3}molL^{-1}s^{-1}$

Answer:

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270. The rate of disappearance of CO in the reaction, $2CO + O_2 \rightarrow 2CO_2$ is $1.28 \times 10^{-3}g/\text{sec}$. Then the rate of

formation of CO_2 is

A. $0.64 \times 10^{-3} g/\sec$

B. $0.80 \times 10^{-3} g/\sec$

C. $1.28 \times 10^{-1} g/\sec$

D. $1.28 \times 10^{-3} g/\sec$

Answer:

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271. The rate constant of a first order reaction is $3 \times 10^{-5} \sec^{-1} M$ If initial concentration is 0.10M, the initial rate is $\left(Ms^{-1}\right)$

A. 3×10^{-6}

B. 3×10^{-5}

C. 3×10^{-8}

D. 3×10^{-7}

Answer:

View Text Solution

272. For the reaction, $2N_2O_5 \rightarrow 4NO_2 + O_2$ rate and rate constant are $1.02 \times 10^{-4} M \sec^{-1}$ and $3.4 \times 10^{-5} \sec^{-1}$ respectively, the concentration of N_2O_5, at that time will be

A. 1.732 M

B. 3 M

C. 1.02×10^{-4} M

D. $3.5 \times 10^5 M$

Answer:

Watch Video Solution

273. For reaction $aA \rightarrow xP$ when [A] =2.2 m M, the rate was found to be 2.4 m Ms^{-1} . On reducing concentration of A to half, rate changes to $0.06mMs^{-1}$. The order of reaction with respect to A is :

A. 1.5

B. 2

C. 2.5

D. 3.0

Answer:

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274. The order for the reaction, $H_2 + Cl_2 \xrightarrow{h\nu} 2HCl$ over water is

A. 0

B. 1

C. 2

D. 3

Answer:

View Text Solution

275. The rate constants k_1 and k_2 for two different reactions are $10^{25}e^{-4000/T}$ and $10^{25}e^{-1000/T}$, respectively. The

temperature at which $k_2 = k_2$ is

A. $\frac{2000}{2.303}K$

B. $2000K$

C. $\frac{3000}{2.303}K$

D. 1000K

Answer:

Watch Video Solution

276. The bromination of acetone that occurs in acid solution is represented by this equation

$CH_3COCH_3(aq) \rightarrow CH_3COCH_2Br(aq) + H^+(aq) + Br^-(aq)$

These kinetic data were obtained for given reaction concentrations.

Based on these data, the rate equation is

A. rate $= k[CH_3COCH_3][Br_2]$

B. rate = $k[CH_3COCH_3][Br_2]\left[H^+\right]^2$

C. rate = $k[CH_3COCH_3]\left[Br_2\left[H^+\right]^2\right.$

D. rate $= k[CH_3COCH_3]\left[H^+\right]$

Answer:

View Text Solution

277. For the reaction $N_2O_5 \rightarrow 2NO_2 + \frac{1}{2}O_2$, the rate of disappearance of N_2O_5 is $6.25 \times 10^{-3} \text{mol L}^{-1}s^{-1}$. The rate of formation of NO_2 and O_2 will be respectively.

A. $6.25 \times 10^{-3} molL^{-1}s^{-1} \& 6.25 \times 10^{-3} molL^{-1}s^{-1}$

B. $1.25 \times 10^{-2} molL^{-1}s^{-1} \& 3.125 \times 10^{-3} molL^{-1}s^{-1}$

C. $6.25 \times 10^{-3} molL^{-1}s^{-1} \& 3.125 \times 10^{-3} molL^{-1}s^{-1}$

D. $1.25 \times 10^{-2} molL^{-1}s^{-1} \& 3.125 \times 10^{-3} molL^{-1}s^{-1}$

Answer:

Watch Video Solution

278. During the kinetic study of the reaction $2A + B \rightarrow C + D$ following results were obtained .

On the basis of above date which one is correct

A. $r = k[A]^2[B]$

B. $r = k[A][B]$

C. $r = k[A]^2[B]^2$

D. $r = k[A][B]^2$

Answer:

View Text Solution

279. In a first order reaction, the concentration of the . reactant is decreased from 1.0M to 0.25M in 20 minute. The rate constant of the reaction would

A. $10min^{-1}$

B. $6.93min^{-1}$

C. $0.693min^{-1}$

D. $0.0693min^{-1}$

Answer:

View Text Solution

280. The decomposition of NH_3 on platinum surface is zero· order with rate constant

$k = 2.5 \times 10^{-4} molL^{-1}s^{-1}$. The rate of production of H_2 will be

A. $2.5 \times 10^{-4} molL^{-1}s^{-1}$

B. $0.83 \times 10^{-4} molL^{-1}s^{-1}$

C. $7.5 \times 10^{-4} molL^{-1}s^{-1}$

D. $5.0 \times 10^{-4} molL^{-1}s^{-1}$

Answer:

View Text Solution

281. $SO_2Cl_2 \rightarrow SO_2 + Cl_2$ is a first order gas reaction with $k = 2.2 \times 10^{-5}\,\text{sec}^{-1}$ at $320^\circ C$ Percentage of SO_2Cl_2 decomposed on heating for 90 minutes is

A. 0.0887

B. 0.887

C. 0.0113

D. 0.113

Answer:

View Text Solution

282. The half-life period of a first order reaction is 15 minutes. The amount of substance left after one hour will be

A. one half

B. one fourth

C. one eighth

D. one sixteenth

Answer:

View Text Solution

283. $99\ \%$ at a first order reaction was completed in $32\ \min$. When will $99.9\ \%$ of the reaction complete.

A. 56 min

B. 26 min

C. 19 min

D. 48 min

Answer:

Watch Video Solution

284. The rate of the first-order reaction $X \rightarrow$ products is $7.5 \times 10^{-4} molL^{-1}\min^{-1}$. What will be value of rate constant when the concentration of X is $0.5 molL^{-1}$?

A. $3.75 \times 10^{-4}\sec^{-1}$

B. $2.5 \times 10^{-5}\sec^{-1}$

C. $1.5 \times 10^{-3}\sec^{-1}$

D. $8 \times 10^{-4}\sec^{-1}$

Answer:

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285. For a reation: $A \rightarrow$ Product,

rate law is $-\frac{d[A]}{dt} = K[A]_0$.

The concentration of A left after time t when $t = \frac{1}{K}$ is:

A. $\frac{[A]_0}{e}$

B. $[A]_0 \times e$

C. $\frac{[A]_0}{e^2}$

D. $\frac{1}{[A]_0}$

Answer:

Watch Video Solution

286. A slope of a graph In [A] versus 't' for a first order is $-5 \times 10^{-4} s^{-1}$. The rate constant for the reaction will be.

A. $10 \times 10^{-3} s^{-1}$

B. $2.5 \times 10^{-3} s^{-1}$

C. $1.086 \times 10^{-3} s^{-1}$

D. $5 \times 10^{-3} s^{-1}$

Answer:

View Text Solution

287. The decomposition of a substance 'R' takes place according to fi rst order kinetics, Its initial concentration is reduced to $\frac{1}{8}$ th in 24 s. The rate constant of the reaction si

A. $\frac{1}{24}s^{-1}$

B. $\frac{0.69}{16s^{-1}}$

C. $\frac{In2}{8}s^{-1}$

D. $\frac{1}{8}s^{-1}$

Answer:

View Text Solution

288. In a zero order reaction, A $\rightarrow$ Products, starting with 0.5 mol L^{-1}, if 0.4 mol L^{-1} are present after 10 min., the rate constant of the reaction will be

A. $0.05molL^{-1}min^{-1}$

B. $0.04molL^{-1}min^{-1}$

C. $10^{-2}molL^{-1}min^{-1}$

D. cannot be determined with the given data

Answer:

View Text Solution

289. The rate of elementary reaction, $A \rightarrow B$, increases by 400 times when the concentration of A is increased twenty folds. The order of the reaction with respect to A is

A. 1

B. 2

C. 10

D. 100

Answer:

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290. The half life for the reaction $N_2O_5 \Leftrightarrow 2NO_2 + \frac{1}{2}O_2$ in $24hr$ at $30^\circ C$. Starting with $10g$ of N_2O_5 how many grams of N_2O_5 will remain after a period of 96 hours ?

A. 1.25 g

B. 0.63 g

C. 1.77 g

D. 0.5 g

Answer:

Watch Video Solution

291. In the first order reaction, the concentration of the reactent is redduced to 25% in one hour. The half life period of the reactiion is a)2 hr b)4hr c)1/2 hr d)1/4 hr

A. 2 hr

B. 4 hr

C. 1/2 hr

D. 1/4 hr.

Answer:

 Watch Video Solution

292. During the decomposition of a gas on the surface of a solid catalyst, $A \rightarrow$ Products, which is a zero order reaction,

the initial pressure of 200 atm of 'A' is reduced to 100 atm in 100 seconds. The rate constant of the reaction is

A. 1 atm s^{-1}

B. 2 atm s^{-1}

C. 4 atm s^{-1}

D. 8 atm s^{-1}

Answer:

View Text Solution

293. Half-life perood for a first order reaction is 10 min. How much time is needed to change the concentration of the reactant from 0.08 M to 0.01 M ?

A. 10 min

B. 30 min

C. 20 min

D. 40 min

Answer:

Watch Video Solution

294. For a first order reaction half life is 14 sec. The time required for the initial concentration to reduce 1/8 of the value is

A. 28s

B. 42s

C. $(14)^3 s$

D. $(14)^2 s$

Answer:

Watch Video Solution

295. For a given reaction, presence of catalyst reduces the energy of activation by 2 kcal at 27^(@)C`. Thus rate of reaction will be increased by:

A. 20 times

B. 14 times

C. 28 times

D. 2 times

Answer:

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296. Rate for a zero order reaction is $2 \times 10^{-2} molL^{-1}s^{-1}$. If the concentration of the reactant after 25s is $0.5M$, the initial concentration must have been

A. 0.5 M

B. 1.25 M

C. 12.5 M

D. 1.0 M

Answer:

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297. A first order reaction is carried out with an initial concentration of 10 mol litre and $80\,\%$ of the reactant changes

into product in $10\,\text{sec}$. Now if the same reaction is carried out with an intial concentration of 5 mol per litre the percentage of the reactant changing to the product in 10 sec is:

A. 40

B. 80

C. 160

D. cannot be calculated

Answer:

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298. What fraction of a reactant showing first order remains after 40 miute if $t_{1/2}$ is 20 minute ?

A. $1/4$

B. $1/2$

C. $1/8$

D. $1/6$

Answer:

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299. For the reaction $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$, under certain conditions of temperature and partial pressure of the reactants, the rate of formation of NH_3 is $0.001 kgh^{-1}$. The same rate of converison of hydrogen under the same condition is.....kgh^{-1}.

A. $1.5 \times 10^{-3} kghr^{-1}$

B. $1.76 \times 10^{-4} kghr^{-1}$

C. $2 \times 10^{-3} kghr^{-1}$

D. $3 \times 10^{-3} kghr^{-1}$

Answer:

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300. The rate constant for a first order reaction is $6.93 \times 10^{-2} min^{-1}$. How long will it take a1M solution to be reduced to 0.5 M?

A. 600 min

B. 6 hr

C. 600 sec

D. 10 sec

Answer:

View Text Solution

301. In a reaction, $2A \rightarrow$ Products the concentration of A decreases from 0.5 "mol" litre^(-1) $\rightarrow 0.4 \text{mol} litre^{-1}$ in 10 minutes. Calculate rate during this interval.

A. 0.05 M min^{-1}

B. $0.005 M min^{-1}$

C. $0.5 M min^{-1}$

D. $5 M min^{-1}$

Answer:

Watch Video Solution

302. For a first order reaction with half-life of 150 seconds, the time taken for the, concentration of the reactant to fall from M/10 to M/100 will be approximately

A. 1500 s

B. 500 s

C. 900 s

D. 600 s

Answer:

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303. A 1^{st} order reaction has specific rate constant of $2\ \min^{-1}$ The half - life of this reaction will be _____.

A. 1.653 min

B. 0.347 min

C. 2 min

D. 0.5 min

Answer:

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304. What will be the order of the reaction if doubling the concentration of a reactant increases the rate by a factor a factor of 4 and tripling the concentration of the reactant by a factor of 9 ?

A. First order

B. Zero order

C. Second order

D. Third order

Answer: C

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305. For a reaction $A + 2B \rightarrow C + D$, the following data were obtained

were obtained

	Initial concentration (mol litre^{-1})		Initial Rate of formation of D (mol litre^{-1} min^{-1})
	[A]	[B]	
1.	0.1	0.1	6.0×10^{-3}
2.	0.3	0.2	7.2×10^{-2}
3.	0.3	0.4	2.88×10^{-1}
4.	0.4	0.1	2.4×10^{-2}

The correct rate law expression will be

A. Rate $= k[A][B]$

B. Rate $= k\{A][B]^2$

C. Rate $= k[A]^2[B]^2$

D. Rate $= k[A]^2[B]$

Answer:

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306. The rate of a gaseous phase reaction becomes half if volume of container is doubled. Order of reaction is

A. 0

B. 1

C. 2

D. 3

Answer:

Watch Video Solution

307. The following date are for the decomposition of ammonium nitrite in aqueous solution

Volume of N_2 in c.c.	Time (minutes)
6.25	10
9.00	15
11.40	20
13.65	25
35.05	∞

The order of the reaction is

A. zero

B. one

C. two

D. three

Answer:

View Text Solution

308. The half-life periof for catalystic decompoistion of AB_3 at $50mm$ is found to be 4 hr and at $100mm$ it is $2.0hr$. The order of reaction is

A. 3

B. 1

C. 2

D. 0

Answer:

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309. In the following first order reactions:

$A + \text{Reagent} \xrightarrow{K_1} Product$

$B + \text{Reagent} \xrightarrow{K_2} Product$

The ratio of K_1 / K_2 when only $50\ \%$ of B reacts in a given time when $94\ \%$ of A has been reacted is:

A. 4.06

B. 0.246

C. 2.06

D. 0.06

Answer:

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310. Mathematical representation for $t_{1/4}$ life i.e., when $1/4th$ reaction is over, is given by:

A. $t_{1/4} = \frac{2.303}{k}\log 4$

B. $t_{1/4} = \frac{2.303}{k}\log 2$

C. $t_{1/4} = \frac{2.303}{k}\log.\ \frac{4}{3}$

D. $t_{1/4} = \frac{2.303}{k}\frac{\log(3)}{4}$

Answer:

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311. In a first order reaction, $75\ \%$ of the reactants disappeared in $1.386hr$. What is the rate constant ?

A. $3.6 \times 10^{-3}s^{-1}$

B. $2.8 \times 10^{-4}s^{-1}$

C. $17.2 \times 10^{-3}s^{-1}$

D. $1.8 \times 10^{-3}s^{-1}$s

Answer:

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312. The following kinetic data are provided for a reaction between A and B :

The value of the rate constant is

A. $1.15 \times 10^{-4} dm^3$/mol min

B. $2.30 \times 10^{-4} dm^6 / mol^{-2}$min

C. $2.30 \times 10^{-2} dm^6 / mol^2$min

D. $1.15 \times 10^{-2} dm^6$/ mol min

Answer:

View Text Solution

313. From the date given below for the the reaction

$A + B \rightarrow$ Products

[A]	[B]	Rate
0.35 M	1.28 M	$0.032\ Ms^{-1}$
0.35 M	0.64 M	$0.008\ Ms^{-1}$
0.70 M	0.64 M	$0.016\ Ms^{-1}$

the expression for rate law is :

A. rate $= k[A]^0[B]$

B. Rate $= k[A][B]$

C. rate $= k[A]^2[B]$

D. rate $= k[A][B]^2$

Answer:

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314. For the reaction $A \rightarrow nB$, at the point of intersection fo two curves show, the [B] is can be given by

A. $\frac{nA_0}{2}$

B. $\frac{A_0}{n-1}$

C. $\frac{nA_0}{n+1}$

D. $\left[\frac{n-1}{n+1}\right]A_0$

Answer:

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315. The rate constatnt of a second order reaction is 10^{-2}mol^{-1} litre $\sec^{-1}$. The rate constant when expressedd in

cm^3 $\text{molecule}^{-1}\text{min}^{-1}$ is :

A. 9.96×10^{-22}

B. 9.96×10^{-23}

C. 9.96×10^{-21}

D. 1.004×10^{-24}

Answer:

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316. The rate of the first order reaction $X \rightarrow$ Products is $7.5 \times 10^{-4} molL^{-1}\ \overset{-1}{\text{min}}$ when the concentration of X is 0.5 mol L^{-1}. The rate constant is

A. $3.75 \times 10^{-4} s^{-1}$

B. $2.5 \times 10^{-5} s^{-1}$

C. $1.5 \times 10^{-3} s^{-1}$

D. $3.0 \times 10^{4} s^{-1}$

Answer:

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317. The inversion of cane sugar proceeds with half life of 500 min at $pH5$ for any concentration of sugar. However, if $pH = 6$, if the half life changes to 50 min. The rate law expression for the sugar inversion can be written as

A. $r = k[\text{sugar}]^{2}\left[H^{+}\right]^{0}$

B. $r = k[\text{sugar}]^{1}\left[H^{+}\right]^{0}$

C. $r = k[\text{sugar}]^{1}\left[H^{+}\right]^{1}$

D. $r = k[\text{sugar}]^0 \left[H^+\right]^1$

Answer:

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318. Two reacants A and B are present such that $[A_0] = 4[B_0]$ and $t_{1/2}$ of A and B are 5 and 15 mintute respectively. If both decay folliwing I order, how much time later will concentrations of both of them would be equal?

A. 15 minute

B. 10 minute

C. 5 minute

D. 12 minute

Answer:

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319. For decomposition of $N_2O_{5(g)}$ dissolved in CCl_4

$$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g),$$

the following data at 300 K is given :

Concentration of Reactant	Rate of decomposition
0.170 M	0.050 M hr^{-1}
0.340 M	0.100 M hr^{-1}
0.680 M	0.200 M hr^{-1}

The rate equation for the reaction is

A. rate $= k[N_2O_5]^2$

B. rate $= k[N_2O_5]$

C. rate $= k[N_2O_5]^3$

D. rate $= k[N_2O_5]^0$s

Answer:

View Text Solution

320. Decomposition of H_2O_2 was studied by titration against $KMnO_4$ solution. It was found that 0.4 mole of H_2O_2 was reduced to 0.2 mole in 20 minutes and to 0.1 mole in 40 minutes and to 0.05 mole after one hour. The order of reaction must be

A. 0

B. 1

C. 2

D. 3

Answer:

View Text Solution

321. The reaction $L \rightarrow M$ is started with 10.0 of L. After 30 and 90 minutes 5.0 g and 1.25 g of L respecetively are left. The order of the reaction is

A. 0

B. 1

C. 2

D. 3

Answer:

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322. The order of a gaseous phase reaction for which rate becomes half if volume of container having same amount of reactant is doubled is

A. 1

B. $1/2$

C. 2

D. $1/3$

Answer:

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323. For a non-equilibrium process $A + B \rightarrow$ Produts the rate is first order with respect to A and second order with respect to

B. If 1.0 Mole each of A and B are introduced into a one liter vessel and the intial rate is 1.0×10^{-2}mol $L^{-1}s^{-1}$, the rate when half of the reaction have been eonsumed is:

A. 1.2×10^{-3}

B. 1.2×10^{-2}

C. 2.5×10^{-4}

D. none of these

Answer:

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324. An elementary reaction is given as $2P + Q \rightarrow$ products. If concentration of Q is kept constant and concentration of P is doubled then rate of reaction is

A. doubled

B. halved

C. quadrupled

D. remains same

Answer:

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325. $2A \rightarrow B + C$ It would be a zero order reaction when : -

A. the rate of reaction is proportional to square of conc. of A

B. the rate reaction remains same at any conc. Of A

C. the rate remains unchanged at any conc. Of B and C

D. the rate of reaction doubles if conc. Of B is increased to double

Answer:

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326. The rate of first-order reaction is $1.5 \times 10^{-2} M \min^{-1}$ at $0.5M$ concentration of reactant. The half-life of reaction is

A. 0.383 min

B. 23.1 min

C. 8.73 min

D. 7.53 min

Answer:

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327. For a I order reaction $A \rightarrow B$ the reaction rate at reactant concentration 0.01 M is found to be $2.5 \times 10^{-5} Ms^{-1}$. The half life period of the reaction is

A. 30s

B. 300 s

C. 220 s

D. 347 s

Answer:

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328. Select the law that corresponds to data shown for the following reaction

Products

A. rate $= k[B]^3$

B. rate $= k[B]^4$

C. rate $= k[A][B]^3$

D. rate $= k[A]^2[B]^2$

Answer:

View Text Solution

329. If 60 % of a first order reaction was completed in 60 minutes, 50 % of the same reaction would be completed in approximately

[log = 4 = 0.60, log 5 = 0.69].

A. 45 minute

B. 60 minute

C. 40 minute

D. 50 minute

Answer:

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330. The reaction $A \rightarrow B$ follows first order kinetics. The time taken for $0.8mol$ of A to produce $0.6mol$ of B is $1hr$. What is the time taken for the conversion of $9.0mol$ of A to Product $0.675mol$ of B ?

A. 1 hour

B. 0. 5 hour

C. 0.25 hour

D. 2 hour

Answer:

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331. For the reaction $N_2 + 3H_2 \rightarrow 2NH_3$ if $\frac{\Delta[NH_3]}{\Delta t} = 2 \times 10^{-4} molL^{-1}s^{-1}$, the value of $\frac{-\Delta[H_2]}{\Delta t}$ would be

A. $1 \times 10^{-4} molL^{-1}s^{-1}$

B. $3 \times 10^{-4} molL^{-1}s^{-1}$

C. $4 \times 10^{-4} molL^{-1}s^{-1}$

D. $6 \times 10^{-4} molL^{-1}s^{-1}$

Answer:

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332. The activation energy of a reaction is $9.0 kcal/mol$.

The increase in the rate consatnt when its temperature is

increased from $298K$ to $308K$ is

A. 0.1

B. 1

C. 0.5

D. 0.63

Answer:

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333. How much faster would a reaction proceed at $25^{\circ}C$ than at $0^{\circ}C$ if the activation energy is $65kJ$?

A. 2 times

B. 16 times

C. 11 times

D. 6 times

Answer:

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334. At 373 K, a gaseous reaction $\rightarrow 2B + C$ is found to be of first order. Starting with pure A, the total pressure at the end of 10 min. was 176 mm and after a long time when A was completely dissociated, it was 270 mm. The pressure of A at the end of 10 minutes was

A. 94 mm

B. 47 mm

C. 43 mm

D. 90mm

Answer:

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335. An endothermic reaction, $A \rightarrow B$ have an activation energy $15kcal/mol$ and the heat of the reaction is $5kcal/mol$. The activation energy of the reaction, $B \rightarrow A$ is:

A. 20 kcal/mol

B. 15 kcal/mol

C. 10 kcal/mol

D. zero

Answer:

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336. For the reaction $2NH_3 \rightarrow N_2 + 3H_2$, if

$$-\frac{d[NH_3]}{dt} = k_1[NH_3],$$
$$\frac{d[N_2]}{dt} = k_2[NH_3],$$
$$\frac{d[H_2]}{dt} = k_3[NH_3]$$

then the relation between k_1, k_2 and k_3 is

A. $k_1 = k_2 = k_3$

B. $k_1 = 3k_2 = 2k_3$

C. $1.5k_1 = 3k_2 = k_3$

D. $2k_1 = k_2 = 3k_3$

Answer:

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337. In a second order reaction, first order in each reactant A and B, which one of the following reactant mixtures will provide the highest initial rate?

A. 0.1 mol of A 0.1 mol of B in 0.1 litre solvent

B. 0.2 mol of A and 0.2 mol of B in 0.1 litre solvent

C. 1.0 mol of A and 1.0 mol of B in 1 litre solvent

D. 0.1 mol of A and 0.1 mol of B in 0.2 litre solvent

Answer:

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338. A first order reaction is 50% complete in 30 minutes at $27^{\circ}C$ and in 10 minutes at $47^{\circ}C$. The energy of activation of

the reaction is

A. $43.83kJmol^{-1}$

B. $34.84kJmol^{-1}$

C. $84.00kJmol^{-1}$

D. $30.00kJmol^{-1}$

Answer:

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339. For $A + B \rightarrow C + D, \Delta H = -20kJmol^{-1}$, the activation energy of the forward reaction is $85kJmol^{-1}$. The activation energy for backward reaction is ..... $kJmol^{-1}$.

A. 65

B. 105

C. 85

D. 40

Answer:

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340. Given that k is the rate constant for some order of any reaction at temp. T then the value of $\lim_{T \to \infty} \log k$= (where A is the Arrhenius constant)

A. A.2,303

B. A

C. 2.303 A

D. log A

Answer:

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341. The chemical reaction $2O_3 \xrightarrow{k_1} 3O_2$ proceeds as follows:

$O_3 \overset{k_{eq}}{\Longleftrightarrow} O_2 + O$ (fast)

$O + O_3 \xrightarrow{k} 2O_2$ (slow)

What should be the rate law expresison ?

A. $r = k[O_3]^2$

B. $r = k[O_3]^2[O_2]^{-1}$

C. $r = k[O_3][O_2]$

D. unpredictable

Answer:

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342. The rate of a certain reaction increases by 2.5 times when the temperature is raised from 300K at 310K. If k is the rate constant at 300K then the rate constant at 310 K will be equal to

A. k

B. 2k

C. 2.5k

D. 3k

Answer:

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343. A substance $''A''$ decomposes in solution following the first order kinetics. Flask I contains $1L$ of $1M$ solution of A and falsk II contains $100mL$ of $0.6M$ solution. After $8hr$, the concentration, of A in flask I becomes $0.25M$. What will be the time for concentration of A in flask II to become $0.3M$?

A. 0.4 hr

B. 2.4 hrs

C. 4.0 hrs

D. unpredictable as rate constant is not given

Answer:

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344. In gaseous reaction, important for the understanding of the upper atmosphere H_2O and O react bimolecularly to from two OH readicals. ΔH for this reaction is 72 kJ at 500 K and E_a is 77 kJ mol^{-1}, then E_a for the bimolecular recombination of two OH readicals to form H_2O and O is :

A. $3kJmol^{-1}$

B. $4kJmol^{-1}$

C. $5kJmol^{-1}$

D. $7kJmol^{-1}$

Answer:

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345. From the following data, the activation energy for the reaction (cal/mol)

$H_2 + I - 2 \rightarrow 2HI$

$H_2 + I_2 \rightarrow 2HI$

T,(K)	$1/T, (K^{-1})$	$\log_{10} k$
769	1.3×10^{-3}	2.9
667	1.5×10^{-3}	1.1

A. 4×10^4

B. 2×10^4

C. 8×10^4

D. 3×10^4

Answer:

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346. A substance undergoes first order decomposition. The decomposition follows two parallel first order reactions

The percentage distribution of B and C are

A. 80% B and 20% C

B. 76.83% B and 23.17%C

C. 90%B and 10% C

D. 60% B and 40% C

Answer:

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347. The concentration of a reactant in a solution falls (i) from 0.2 to 0.1 M in 2 hrs (ii) from 0.2 to 0.05 M in 4 hrs. The order of hydrolysis of the reactant is

A. zero

B. two

C. one

D. half

Answer:

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348. The rate constant of a reaction increases by 5% when its temperature is raised from $27^{\circ}c$ to $28^{\circ}c$. The activation

energy of the reaction is

A. 36 kJ/mol

B. 16.6 kJ/mol

C. 46.6 kJ/mol

D. 26.6 kJ/mol

Answer:

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349. Milk turns sour at $40^\circ C$ three times faster as at $0^\circ C$. The energy of activation for souring of milk is:

A. 4.693 kacal

B. 2.6 kcal

C. 66.6 kcal

D. none of these

Answer:

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350. If a reaction $A + B \rightarrow C$ is exothermic to the extent of 30 kJ/mol and the forward reaction has an activation energy of 70 kJ/mol, the activation energy for the reverse reaction is

A. 30 kJ/mol

B. 40 kJ/mol

C. 70 kJ/mol

D. 100 kJ/mol

Answer:

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351. The activation energy of a reaction is 9 kcal/mol. The increase in the rate constant when its temperature is raised from 395 to 300K is approximately

A. 0.1

B. 0.5

C. 1

D. 0.25

Answer:

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