



CHEMISTRY

BOOKS - P BAHADUR CHEMISTRY (HINGLISH)

SURFACE CHEMISTRY

Exercise

1. In a reversible reaction, a catalyst :

A. increases the rate of the forward reaction only

B. increase the rate of the forward reaction at greater extent than that of the backward reaction.

C. increase the rate of the forward reaction and decreases that of the backward reaction to different extent

D. increases the rate of the forward and backward reactions equally .

Answer: D



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2. A catalyst is a substance which :

A. alters the equilibrium in a reaction

B. does not participate in the reaction but speeds it up

C. participates in the reaction and provides an easier pathway for the reaction

D. is always in the same phase as the reactants

Answer: C



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3. The efficiency of an enzyme in catalyzing a reaction is due to its capacity

A. to form an enzyme-substrate complex

B. to decrease the bond energies of the substrate molecule

C. to change the shape of the substrate molecule

D. none of these

Answer: A



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4. Hydrolysis of cane sugar is catalysed by :

A. H^+

B. mineral acids

C. enzymes

D. all of these

Answer: D



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5. Which is false for catalyst ?

A. A catalyst can initiate a reaction

B. It does not alter the position of the equilibrium in a reversible reaction

C. A catalyst remains unchanged composition at the end of the reaction

D. Catalysts are sometimes very specific in respect of a reaction

Answer: A



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6. Which acts as poison for Pd-charcoal in Lindlar catalyst ?

A. $BaSO_4$

B. quinoline

C. Both a and b

D. none of these

Answer: C



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7. Which statement about enzymes is not correct ?

- A. Enzymes are in colloidal state
- B. Enzymes can act as catalysts
- C. Enzymes can catalyse any reaction
- D. Urea is an enzyme

Answer: C



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8. Which is an example of auto-catalysis ?

A. Decomposition of $KClO_3 + MnO_2$

mixture

B. The decomposition of nitroglycerine

C. Breakdown of $^{14}_6C$.

D. Hydrogenation of vegetable oils using Ni

catalyst

Answer: B



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9. Which forms cationic micelle ?

A. Sodium dodecyl sulphate

B. Sodium acetate

C. Urea

D. Cetyl trimethyl ammonium bromide

Answer: D



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10. Which type of metals form effective catalysts ?

A. Alkali metals

B. Transition metals

C. Alkaline earths

D. Radioactive metals

Answer: B



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11. The decomposition of hydrogen peroxide can be slowed by addition of a small amount of acetamide .

A. detainer

B. stopper

C. promoter

D. inhibitor

Answer: D



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12. Which is wrong in case of enzyme catalysis ?

A. Enzymes are in collodal state at an optimum temperature

B. Enzymes work at an optimum pH

C. Enzymes are highly specific for substrates

D. An enzyme raises activatio enrgy

Answer: D



13. The oxidation of oxalic acid by acidified $KMnO_4$ becomes fast as the reaction progresses due to :

A. auto-catalysis by Mn^{2+}

B. presence of SO_4^{2-}

C. Presence of K^+

D. presence of MnO_4^-

Answer: A



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14. A plot of $\log \frac{X}{m}$ vs. $\log P$ for the adsorption of a gas on a solid gives a straight line with slope equal to :

A. $1/n$

B. $\ln K$

C. $-\log K$

D. n

Answer: A



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15. Physical adsorption is :

A. highly specific

B. reversible

C. irreversible

D. monolayer

Answer: B



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16. The minimum energy level necessary to permit a reaction to occur is :

A. internal energy

B. threshold energy

C. free energy activation energy

D. activation energy

Answer: B



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17. According to Langmuir adsorption isotherm, the amount of gas adsorbed at very high pressure

- A. reaches a constant limiting value
- B. goes on increasing with pressure
- C. goes on decreasing with pressure
- D. increases first and decrease later with pressure

Answer: A



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18. *ZSM* – 5 is used to conver :

- A. alcohol to petrol
- B. benzene to toluen
- C. toluene to benzen
- D. heptance to toluene

Answer: A



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19. Which equation represents Freundlich adsorption isotherm (physical adsorption is basis of this theory) ?

A. $\frac{x}{m} = K(P)^{1/n}$ where x is amount of gas

adsorbed on mass m at pressure P

B. $\frac{\log x}{m} = \log K + 1/n \log P$

C. $\frac{x}{m} = KP$ at low pressure and $\frac{x}{m} = K$

at high pressure

D. all of these

Answer: D



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20. The amount of gas adsorbed physically on charcoal increases with :

- A. temperature and pressure
- B. temperature and decrease with pressure
- C. pressure and decrease with temperature
- D. none of these

Answer: C



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21. Gas masks containing activated chrcoal to remove poisonous gases from atmosphere act on principle of

A. adsortion

B. absorpton

C. sorpton

D. all of these

Answer: A



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22. Zeolites are :

A. water softener

B. catalyst

C. Both a and b

D. none of these

Answer: C



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23. The activity and selectivity of zeolites as catalyst is based on :

- A. their pore size
- B. size of their cavities on the surface
- C. Both a and b
- D. none of these

Answer: C



24. Catalysts are more effective in

A. finely powdered state

B. colloidal state

C. rough surface

D. all of these

Answer: D

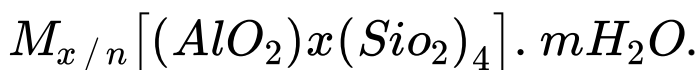


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25. Zeolites :

A. are microporous aluminosilicate

B. have general formula



C. have pore sizes between $260 \pm$ to 740 pm`

D. all of these

Answer: D



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26. Which gas is adsorbed strongly by charcoal ?

A. CO

B. N_2

C. H_2

D. NH_3

Answer: D



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27. Which forms multimolecular layers during adsorption ?

A. Physical adsorption

B. van der Waals' adsorption

C. free energy activation adsorption

D. all of these

Answer: D



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28. The curve showing the variation of adsorption with pressure at constant temperature is called :

- A. an isotherm
- B. adsorption isotherm
- C. absorption isotherm
- D. all of these

Answer: B



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29. Dyeing of fiber involves the process of :

A. adsorption

B. absorpton

C. sorpton

D. all of these

Answer: D



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30. Which can adsorb large volume of hydrogen gas ?

A. Colloidal solution of palladium

B. Finely divided nickel

C. Finely divided platinum

D. Colloidal $Fe(OH)_3$

Answer: A



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31. A plot of $\log \frac{X}{m}$ vs. $\log P$ for the adsorption of a gas on a solid gives a straight line with slope equal to :

A. K

B. $\log K$

C. $\ln K$

D. $1/n$

Answer: D



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32. Which one is not the characteristic of chemisorption ?

- A. Multilayer adsorption
- B. Exothermic in nature
- C. Strong adsorption by free valencies
- D. Irreversible

Answer: A



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33. The function of alcohol addition in stroing chloroform is :

- A. to act as negative catalyst
- B. to retard he oxidation of $CHCl_3$
- C. to react with $COCl_2$ if formed
- D. all of these

Answer: D



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34. Adsorption is accompanied by :

A. decrease in entropy of system

B. decrease in enthalpy

C. the value δH is negative

D. all of the

Answer: D



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35. On adding few drops of dil HCl or FeCl_3 to freshly precipitated ferric hydroxide, a red coloured colloidal solution is obtained. This phenomenon is known as :

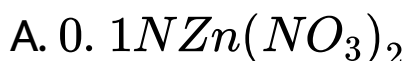
- A. peptization
- B. dialysis
- C. protection dissolution
- D. none of the above

Answer: A



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36. The arsenious sulphide sol has negative charge . The maximum coagulating power for precipitating it is of :



Answer: D





37. Lyophilic sols are more stable than lyophobic sols because :

- A. the colloidal particles have positive charge
- B. the colloidal particles have no charge
- C. the colloidal particles are solvated
- D. there are a strong electrostatic repulsion between the negatively

charged collidal particels

Answer: C



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38. The Brownian motion is due to :

A. temperature fluctuations within the liquid phase

B. attraction and repulsion between charges on the colloidal particles

C. impact of the molecules of the dispersion medium on the colloidal particles

D. converging currents

Answer: C



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39. the use of alum in purifying muddy water involves :

A. absorpton

B. adsorpton

C. dialysis

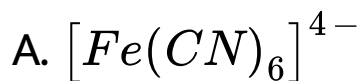
D. coagulation

Answer: D



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40. Which ion has least flocculation value for $a + ve$ sol ?

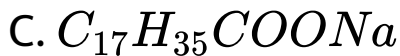
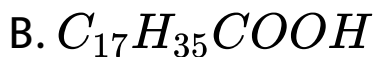
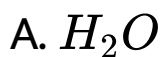


Answer: A



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41. Which of the following represents surfactant molecule ?



D. none of these

Answer: C



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42. Bleeding is stopped by the application of ferric chloride. This is because

A. the blood starts flowing in the opposite direction

B. the blood reacts and a solid is formed which seals the blood vessel

C. the blood is coagulated and the blood vessel is sealed

D. the ferric chloride seals the blood vessel

Answer: C



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43. Gelatin is often used as an ingredient in the manufacture of ice-cream. The reason for this is :

- A. to stabilize the formation of a colloid
- B. to stabilize colloid and prevent crystal growth
- C. to cause the mixture to solidify
- D. to improve the flavour

Answer: B



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44. Cloud bursts due to :

A. attraction towards the electrical charges

on the earth

B. large amount of water present in the

cloud

C. dense cloud are present in the upper atmosphere

D. mutual discharge of oppositely charged clouds resulting in the coagulation.

Answer: D



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45. The cotterells precipittor is used to :

- A. neutralise charge on carbon particles in
air in smoke
- B. coagulate carbon atoms of smoke
- C. bring in cataphoresis in carbon particles
- D. all of these

Answer: D



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46. Peptization is a process of :

- A. precipitating colloidal particles
- B. purifying colloidal particles
- C. dispersing the precipitate into colloidal state
- D. none of these

Answer: C



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47. The blue colour of the water of the sea is due to :

- A. refraction of the blue light by the impurities in sea-water
- B. reflection of blue light by sea-water
- C. scattering of blue light by sea particles
- D. absorption of other colours except the blue colour by water molecules

Answer: C



48. The property of colloidal suspension used to determine the nature of charge on the particles is :

- A. dialysis
- B. electrophoresis
- C. sedimentation
- D. ultrafiltration

Answer: B



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49. Addition of dil. Solution of $AgNO_3(aq)$, to excess of dil . $KI(aq)$. Gives :

A. AgI

B. $+ve$ sol of AgI

C. $-ve$ sol of AgI

D. neutral sol of AgI

Answer: C



50. Ultramicroscope works on the principle of

:

- A. light refraction
- B. light absorption
- C. light scattering
- D. light polarisation

Answer: C



51. The coagulation power of an electrolyte is measured in terms of :

A. coagulation value

B. protective value

C. gold number

D. none of these

Answer: A



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52. The degree of protection of a lyophobic colloid by the addition of a lyophilic colloid is measured in terms of :

- A. gold numer
- B. coagultion value
- C. sedimentation
- D. none of these

Answer: A



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53. The minimum concentration of the electrolyte required to cause coagulation of a sol is called :

A. precipitation power

B. flocculation value

C. coagulation power

D. gold number

Answer: B



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54. The addition of alcohol to a saturated aqueous solution of calcium acetate first forms a sol and then sets to a gelatinous mass called solid alcohol which is a:

- A. solid sol
- B. aerosol
- C. solid form gel
- D. gel

Answer: D



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55. The colloidal solutions of gold prepared by different methods have different colours due to :

A. difference in the size and shape :

B. the fact that gold exhibits variable valency

C. different concentration of gold

D. presence of different types of colloidal particles

Answer: A



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56. The potential difference between the fixed particles layer and the diffused layer having opposite charge is called :

- A. zeta potential
- B. colloidal potential
- C. streaming potential
- D. zorn potential

Answer: A



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57. At CMC , the surfactant molecules undergoes :

- A. association
- B. aggergation
- C. micelle formation
- D. all of these

Answer: D



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58. Silica gel is commorably used as :

A. wetting agent

B. drying agent

C. solvent

D. catalyst

Answer: B



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59. The cementation process is :

- A. gel formation
- B. emulsion formation
- C. either of them
- D. none of these

Answer: A



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60. An example of solid -solid system is :

A. smoke

B. cake

C. synthetic gems

D. pumic stone

Answer: C



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61. The outcome of internal liquid of gels on shear is called :

A. syneresis

B. thixotropy

C. swelling

D. none of these

Answer: D



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62. Colloidal solution commonly used in treatment of eye disease is :

- A. colloidal sulphur
- B. colloidal silver
- C. colloidal gold
- D. colloidal antimony

Answer: D



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63. Mediciners are more effective if they are used in :

- A. solid state
- B. colloidal state
- C. solution state
- D. none of these

Answer: A



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64. Whenever gels are placed with their dispersed phase . They :

A. swells up

B. show intake of the dispersed phas

C. develops imbiition

D. all of these

Answer: D



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65. If oil and water are made to mix in presence of soap mixture is :

A. solution

B. suspension

C. emulsion

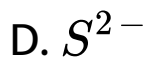
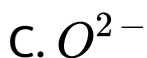
D. stable emulsion

Answer: D



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66. The negative charge on As_2S_3 sol is due to adsorption of :



Answer: D



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67. The detergency action of soap is due to its

:

A. emulsifying property

B. micellisation

C. Both (a) and (b)

D. solubility in water

Answer: C



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68. An example of intrinsic colloid is :

A. As_2S_3 sol

B. $Fe(OH)_3$ sol

C. egg albumin

D. Au sol

Answer: C



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69. In styrene foam , the dispersed phas and dispersion medium are respectively :

A. gas , gas

B. solid , solid

C. gas,solid

D. soild , liquid

Answer: C



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70. In multimolecular colloidal solutions , atoms or molecules are held together by :

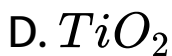
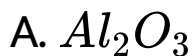
- A. H-bonding
- B. van der Waals forces
- C. ionic bonding
- D. covalent bonding

Answer: B



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71. Artificial smoke screens are made by :



Answer: D



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72. Some types of gels like gelatin loose water slowly . The process is known as :

A. syneresis

B. thixotropy

C. peptisation

D. imbibition

Answer: A



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73. Soaking of water by a sponge is an example of :

- A. simple adsorption
- B. physical adsorption
- C. chemisorption
- D. absorption

Answer: D



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74. Formation of ozon from oxygen in atmosphere is catalysed by :

A. NO

B. N_2

C. CO

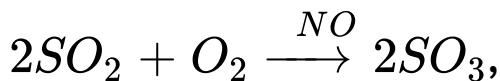
D. sunlight

Answer: A



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75. In the formation of SO_3 by:



the catalytic action of NO is evidenced by the formation of :

A. brown vapours

B. green vapours

C. violet vapours

D. none of these

Answer: A



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76. The aerosol is (are) the colloidal system (s) of :

- A. solid dispersed in gas
- B. liquid dispersed in gas
- C. gas dispersed in solid
- D. gas dispersed liquid

Answer: a,b



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77. Which of the following is (are) colloid (s) ?

A. Muddy water

B. Milk

C. Blood

D. Chlorophyll

Answer: a,b,c



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78. Which is (are) correct statement (s) ?

A. Water is absorbed by anhydrous $CaCl_2$

B. Water is adsorbed by silica gel

C. NH_3 is absorbed by water but adsorbed
by charcoal

D. Decolorisation of sugar by animal
charcoal is based on adsorption

Answer: a,b,c,d,



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79. The coagulation of sol particles may be brought in by :

A. heating

B. adding oppositely charged sol

C. adding electrolyte

D. persitent dialysis

Answer: a,b,c,d,



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80. The capacity of an ion to coagulate a colloidal solution depends on :

- A. its shape
- B. amount of its charge
- C. the sign of charge
- D. none of these

Answer: b,c



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81. Difference in between crystallid and colloid is of :

- A. particle size
- B. to exhibit Tyndall effect
- C. diffusion through a membrane
- D. none of these

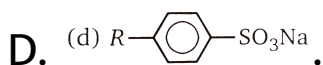
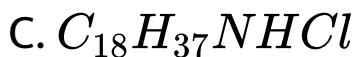
Answer: a,b,c,d,



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82. Cationic surfacant (s) is (\rightarrow) :

A. the substances whose cation possesses
surface activity



Answer: a,c



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83. Which is (rarr) not lyophobic in nature ?

A. Gelation

B. sulphur

C. Starch

D. Protein

Answer: a,cd,



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84. The size of the colloid particles is :

- A. less than Suspension particles
- B. greater than Suspension particles
- C. less than True solution particles
- D. none of these

Answer: b,c,



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85. Anionic surfactant (s) is (are) .

A. the substances whose anion possesses
surfaces acitivity

B. (b) $C_{15}H_{31}COONa$ and $R\text{C}_6\text{H}_4\text{SO}_3\text{Na}$

C. $C_{18}H_{37}NH_3Cl$

D. anion are associated to form micelles

Answer: a,b,d



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86. Which is (are) not natural colloid (s) ?

A. NaCl

B. Blood

C. RCOONa

D. sugar

Answer: a,c,d



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87. The rate of a reaction increases with the addition of catalyst . Which of the following statement (s) do//does not explain this ?

A. The average kinetic energy of the molecules decreases

B. The number of collision increase

C. The activation energy increases

D. The activation energy decrease

Answer: a,b,c,d,



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88. A catalyst :

A. remains unchanged chemically at the end of a reaction

B. usually does not initiate a reaction

C. does not alter the equilibrium in a reversible reaction

D. is used for altering the velocity of the reaction

Answer: a,c,d,



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89. Which of the following statement (s) is (are) correct ?

A. Iron is used as a catalyst in the hydrogenation of oils

B. V_2O_5 is used as a catalyst in the oxidation of SO_2 to SO_3

C. Haber's process requires iron as a catalyst

D. Thermite process does not involve any catalyst

Answer: b,c,d



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90. Which of the following statement (s) is (are) true ?

A. Anhydrous $AlCl_3$ is used as a catalyst in Friedel -Craftes reaction

B. The oxidation of SO_2 to SO_3 requires V_2O_5 as the catalyst .

C. The hydrogenation of oil requires nickel
as the catalyst

D. none of these

Answer: a,b,c



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91. Which of the following statements is/are correct in the case of heterogenous catalyst?

A. The cataluyst decreases the energy of activation

B. The surface of catlyst plays an important role

C. The catalyst actually forms a compound with ractants

D. There is no change in the energy of activartion

Answer: a,b,c



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92. Which is (are) not true in case of catalyst ?

A. A catalyst is active only in solution

B. The addition of catalyst changes the
equilibrium constant

C. A catalyst speeds up forward reaction
and slows the backward reaction

D. The composition of equilibrium mixture
is not changed by a catalyst

Answer: a,b,c



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93. Protons accelerate the hydrolysis of esters .

This is an example of :

A. a promoter

B. a heterogeneous catalyst

C. an acid base catalyst

D. an auto-catalyst

Answer: c,d,



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94. In a reversible reaction, the function (s) of the catalyst is (are) :

A. to increase the rate of the forward reactions only

B. to influence the forward and backward reactions to the same extent

C. to reduce the time required for reaching
the equilibrium state

D. none of these

Answer: b,c



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95. Which of the following statements about catalysts is // sre true ?

A. They change the equilibrium constant

B. They decrease the activation energy

C. They shorten the time taken to reach equilibrium

D. They influence the forward and the reverse reactions to the same extent

Answer: b,c,d



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96. Which act (s) as negative catalyst ?

- A. Lead tetraethyl as antiknock compound
- B. Glycerol in decomposition of H_2O_2
- C. Ethanol in oxidation of chloroform
- D. None of these

Answer:



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97. Which a catalyst is added to a system, the :

- A. value of the equilibrium constant
decrease
- B. equilibrium concentrations are
unaffected
- C. rate of reaction is increased
- D. activation energy of the reaction
decreases

Answer: b,c,d



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98. Which is (are) true in case of catalyst ?

A. A catalyst usually does not initiate a reaction

B. It does not alter the position of the equilibrium in a reversible reaction

C. A catalyst remains unchanged composition at the end of the reaction

D. Catalysts are sometimes very specific in respect of a reaction

Answer: b,d



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99. Which is (are) not the example (s) of heterogenous catalysis ?

A. Formation of SO_3 in the chamber process

B. Formation of SO_3 in the contact process

C. Hydrolysis of an ester in the presences
of H^+ ions

D. Combination of H_2 and Cl_2 in the
presence of moisture .

Answer: a,c,d



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100. The correct statement(s) pertaining to
the adsorption of a gas on a solid surface is
(are)

A. Adsorption is always exothermic

B. Physisorption may transform into chemisorption at high temperature

C. Physisorption increases with increasing temperature but chemisorption decreases with increasing temperature

D. Chemisorption is more exothermic than physisorption, however it is very slow due to higher energy of activation

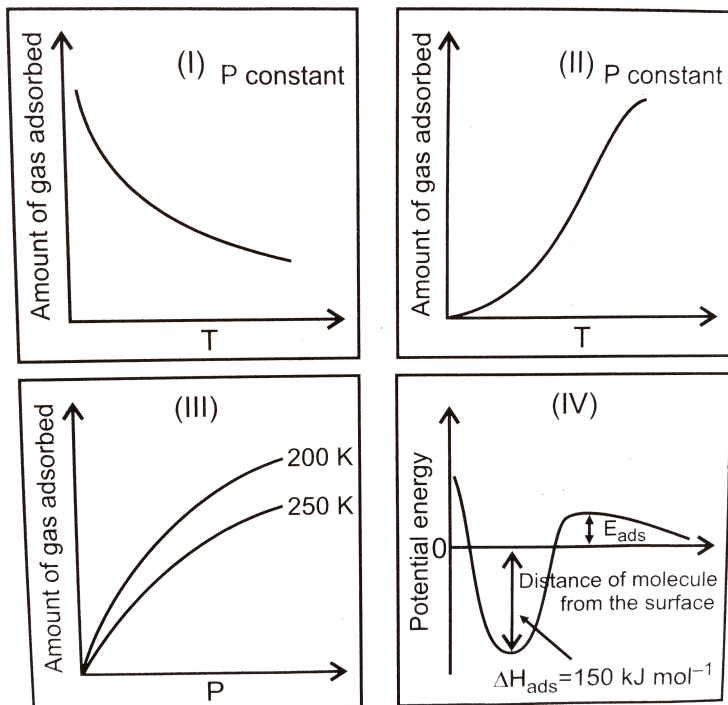
Answer: a,b,d



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101. The given graphs//data *I*, *II*, *III* and *IV* represent general trends observed of different physorption and chemisorption processes under mild conditions of temperature and pressure, which of the following choice (s)

about *I*, *II*, *III* and *IV* is (are) correct?



A. I is physisorption and II is chemisorption.

B. I is physisorption and III is chemisorption.

C. IV is chemisorption and II is chemisorption.

D. IV is chemisorption and III is chemisorption .

Answer: a,c



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102. Choose the correct reason(s) for the stability of the lyophobic colloidal particles.

A. Preferential adroption of ions on their surface form the solution

B. Preferential adroption of ions on their surface form the solution

C. Attraction between different particles having oppositie charges on their surface.

D. Potential differnce between the fixed layer and the diffused layer of opposite chargea reound the collidal particles .

Answer: a,d



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103. Alum is used in purifying water by :

A. Forming silicon complex with clay particles

B. sulphate combines with dirt and removes it

C. coagulating the mud particles

D. making mud water soluble

Answer: c



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104. Which is not correct for physical adsorption ?

A. Adsorption is spontaneous

B. Both enthalpy and entropy of adsorption are negative

C. Adsorption on solid is reversible

D. Adsorption increase with increase in temperature

Answer: d



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105. Identify the correct statement regarding enzymes.

A. Enzymes are specific biological catalyst that possess well defined active sites

B. Enzymes are normally heterogeneous catalyst that are very specific in their action

C. Enzymes are specific biological catalyst that cannot be poisoned .

D. Enzymes are specific biological catalysts that can normally function at very high temperature ($T = 1000K$)

Answer: b



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106. The volume of colloidal particles V_c as compared to the volume of solute particles in true solution V_c could be :

A. ~ 1

B. $\sim 10^{23}$

C. $\sim 10^{-3}$

D. $\sim 10^3$

Answer: d



Watch Video Solution

107. The dispersed phase in colloidal iron (III) hydroxide and colloidal gold is positively and negatively charged respectively. Which of the following statement is not correct ?

A. Magnesium chloride solution

coagulates gold sol readily than iron (III)

hydroxide sol

B. Sodium sulphate solution causes coagulation in both sol .

C. Mixing of the two sold has no effect

D. Coagulation in both sol can be brought about by electrophoresis

Answer: c



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108. In Langumir's model of asosrption of a gas on a solid surface :

A. the rate of dissociation of adsorbed molecules from the surface does not depend on the surface covered

B. The assumption at a single site on the surface may involve multiple molecules at the same time

C. the mass of gas striking a given area of surface is proportional to the pressure of the gas.

D. the mass of gas striking a given area of surface is independent of the pressure of the gas

Answer: c



Watch Video Solution

109. Gold numbers of protective colloids A, B, C and D are 0.05, 0.01, 0.10, and 0.005 respectively. The correct order of their protective powers is :

A. $D < A < C < B$

B. $C < B < D < A$

C. $A < C < B < D$

D. $B < D < A < C$

Answer: c



Watch Video Solution

110. Which of the following statements is incorrect regarding physisorptions ?

A. It occurs because of van der Waals forces

B. More easily liquefiable gases are adsorbed readily

C. Under high pressure it results into multi-molecular layer on adsorbent surface

D. Enthalpy of adsorption ($\Delta H_{adsorp \rightarrow n}$) is low and positive .

Answer: d



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111. Rate of physisorption increases with :

A. decrease in temperature

B. increase in temperature

C. decrease in pressure

D. decrease in surface area

Answer: a



Watch Video Solution

112. Adsorption of gases on solid surface is generally exothermic because :

A. enthalpy is positive

B. entropy decrease

C. entropy increases

D. free energy increase

Answer: b



Watch Video Solution

113. Lyophilic sols are

A. irreversible sols

B. they are prepared from inorganic compounds

C. not coagulated by adding electrolytes

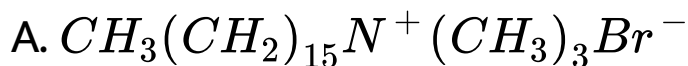
D. self stabilizing

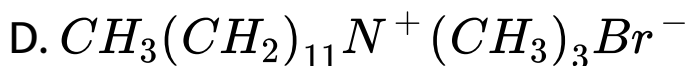
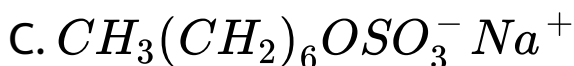
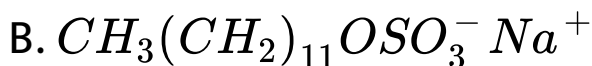
Answer: d



Watch Video Solution

114. Among the following , the surfactant that will form micelles in aqueous solution at the lowest cmc concentration at ambient conditions, is :



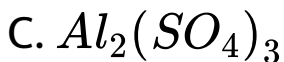
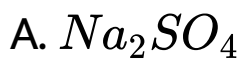


Answer: a



Watch Video Solution

115. Among the electrolytes Na , SO_4 , $CaCl_4$, $Al_2(SO_4)_3$ and NH_4Cl , the most effective coagulating agent for Sb_2S_3 sol is :



Answer: c



Watch Video Solution

116. According to Freundlich adsorption isotherm, which of the following is correct ?

A. $\frac{x}{m} \propto p^1$

B. $\frac{x}{m} \propto p^{1/n}$

C. $\frac{x}{m} \propto P^0$

D. All the above are correct for different ranges of pressure .

Answer: d



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117. The activity of a catalyst has been explained in terms of spontaneous adsorption of reactant molecule on the surface of catalyst and then by forming an activated adsorbed complex along with evolution of heat. The adsorbed activated complex undergoes decomposition to regenerate catalyst and give products. Adsorption is of two types :

(i) Physical adsorption due to van der Waal's forces of attraction between reactant and catalyst molecules, weak, less exothermic, multilayer and non-directional.

(ii) Chemical adsorption due to free valencies , strong, more exothermic, unilayer. The extent of adsorption (x/m) vs temperature at constant pressure gives isobars. Freundlich studied influence of pressure on the physical adsorptions and reported that $\log \frac{x}{m} = \log K + \frac{1}{n} \log P$.

Select the correct statements .

A. I, II, III

B. I,II,IV

C. II, III, IV

D. I,II,IV

Answer: a



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118. The activity of a catalyst has been explained in terms of spontaneous adsorption of reactant molecules on the surface of catalyst and then by forming an activated adsorbed complex along with evolution of heat. The adsorbed activated complex undergoes to

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$$\frac{x}{m} \log K + \frac{1}{n} \log P.$$

During adsorption of reactant molecules on catalyst surface :

A.

$$\Delta G = -ve, \Delta H = -ve, \Delta S = -ve$$

B.

$$\Delta G = -ve, \Delta H = -ve, \Delta S = -ve$$

C.

$$\Delta G = +ve, \Delta H = -ve, \Delta S = +ve$$

D.

$$\Delta G = -ve, \Delta H = -ve, \Delta S = +ve$$

Answer: b



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119. The activity of a catalyst has been explained in terms of spontaneous adsorption of reactant molecules on the surface of catalyst and then by forming an activated adsorbed complex along with evolution of heat. The adsorbed activated complex undergoes decomposition to regenerate catalyst and give products. Adsorption is of two types :

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The graph plotted between $\log \frac{x}{m}$ vs $\log P$ was found to be a straight line. The slope and

intercept of line less for $\frac{1}{n}$ and $\log K$ values .

find the wrong statement .

A. The relation holds good at average pressure

B. The relation fails in case of chemical adsorption

C. At very low pressure $n = 1$

D. none of these

Answer: d



Watch Video Solution

120. The activity of a catalyst has been explained in terms of spontaneous adsorption of reactant molecule on the surface of catalyst and then by forming an activated adsorbed complex along with evolution of heat. The adsorbed activated complex undergoes decomposition to regenerate catalyst and give products. Adsorption is of two types :

(i) Physical adsorption due to van der Waal's forces of attraction between reactant and catalyst molecules, weak, less exothermic,

multilayer and non-directional .

(ii) Chemical adsorption due to free valencies , strong, more exothermic, unilayer. The extent of adsorption (x/m) vs temperature at constant pressure gives isobars. Freundlich studied influence of pressure on the physical adsorptions and reported that $\log \frac{x}{m} = \log K + \frac{1}{n} \log P$.

The extent of adsorption depends on :

A. nature and surface area of adsorbent

B. nature and concentration of adsorbate

C. temperature

D. all of these

Answer: d



Watch Video Solution

121. Surfactants are the substances which show surface activity. Detergents possess surface activity as well as detergency. Soaps are anionic class of detergents. It is the hydrophilic part of detergent molecule which possesses the tendency to attract water

molecule whereas hydrophilic balances part orients away from water. The hydrophilic-lipophilic balance (HLB) leads to aggregation of anionic or non-ionic or cationic part of detergent to form micelles. Each molecule has the definite concentration at definite temperature at which it starts to aggregate. It is due to the presence of two moieties in their molecules, surfactants stabilize emulsion (a water-oil system). Due to larger surface area, the medicines are more effective in emulsion form. Emulsions are *w/o* or *o/w* type. A water soluble dye imparts its colour to *o/w*

emulsions.

Which is incorrect about soaps?

- A. Soaps are metal salts of fatty acids
- B. Soaps are anionic class of surfactants of detergents
- C. Soaps form anionic micelles i.e., carrying -ve charge .
- D. none of these

Answer: d



Watch Video Solution

122. Surfactants are the substances which show surface activity. Detergents possess surface activity as well as detergency. Soaps are anionic class of detergents. It is the hydrophilic part of detergent molecule which possesses the tendency to attract water molecule whereas hydrophobic part orients away from water. The hydrophilic-lipophilic balance (HLB) leads to aggregation of anionic or non-ionic or cationic part of detergent to form micelles. Each molecule has

the definite concentration at definite temperature at which it starts to aggregate. It is due to the presence of two moieties in their molecules, surfactants stabilize emulsion (a water -oil system) . Due to larger surface area, the medicines are more effective in emulsion form . Emulsions are *w/o* or *o/w* type. A water soluble dye imparts its colour to *o/w* emulsions.

which of the following forms a cationic micelle?

A. Sodium dodecyl sulphate in water

B. Sodium dodecyl benzene sulphonate in water

C. Sodium octanoate

D. Dodecyl ammonium chloride

Answer: d



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123. Surfactants are the substances which show surface activity. Detergents possess surface activity as well as detergency. Soaps

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the medicaments are more effective in emulsion form. Emulsions are *w/o* or *o/w* type. A water soluble dye imparts its colour to *o/w* emulsions.

Which might have lowest value of critical micelle concentration in water ?

- A. Sodium octanoate
- B. Sodium decanoate
- C. Sodium hexanoate
- D. Sodium dodecanoate

Answer: d



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124. Surfactants are the substances which show surface activity. Detergents possess surface activity as well as detergency. Soaps are anionic class of detergents. It is the hydrophilic part of detergent molecule which possesses the tendency to attract water molecule whereas hydrophobic part orients away from water. The hydrophilic-lipophilic balance (HLB) leads to differentiation of anionic or non-ionic or cationic part of

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Select the correct statements .

1. In multimolecular colloidal solutions of molecules are held together by van der

Waaks' forces

Cleansing action of soap is due to adsorption of oily and greasy material at hydrophilic centres

III. Hydrophilic part of oily and greasy material at hydrophilic centres

IV. The aggregation of ions i.e., micelle formation is independent of temperature.

A. I, II, III

B. I, II, IV

C. I, II

D. II,,III

Answer: c



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125. Surfactants are the substances which show surface activity .Detergents possess surface activitiy as wll as detergency . Soaps are anionic class of detergents . It is the hydorphilic part of detergent momencule which possesses the tendecy to attract water

molecule whereas hydrophilic balances part orients away from water. The hydrophilic-lipophilic balance (HLB) leads to aggregation of anionic or non-ionic or cationic part of detergent to form micelles. Each molecule has the definite concentration at definite temperature at which it starts to aggregate. It is due to the presence of two moieties in their molecules, surfactants stabilize emulsion (a water-oil system). Due to larger surface area, the medicines are more effective in emulsion form. Emulsions are *w/o* or *o/w* type. A water soluble dye imparts its colour to *o/w*

emulsions.

Select the correct statements .

I. Butter is water dispersed in fat

II. Milk is fat disperse in water

III. Surfactants lower the surface tension of
liquids

IV. Indigo a dye will impart blue colour to
whole butter

A. I, II, III

B. I, II, IV

C. II, III, IV

D. All of these

Answer: a



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126. Statements : A day's term catalyst means specifically for a substance that accelerates the reaction.

Explanations : The term inhibitor is commonly used for substances which retard the rate of reaction.

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not
correct explanation of S.

Answer: D



Watch Video Solution

127. Statements : The activity of catalyst is more or less specific.

Explanations : A catalyst for one reaction is not necessary to catalyse the other reaction .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: D



Watch Video Solution

128. Statements : The effectiveness of catalyst has found more applications in solid catalyst and gaseous reactant systems .

Explanations : A large number of industrial preparations are based on this type of reaction .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

129. Statements : Thermal decomposition of $KClO_{3(s)}$ in presence of $MnO_{2(s)}$ is an example of homogeneous catalysis.

Explanations : A homogeneous catalysis involves phase $P = 1$

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: B



Watch Video Solution

130. Statements : A catalyst lowers the threshold energy level for reaction .

Explanations : Catalyst combines with reactant to form an exothermic intermediate and provide another pathway to reaction .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not
correct explanation of S.

Answer: C



Watch Video Solution

131. Statements : Lead tetraethyl acts as inhibitor for combustion of gasoline .

Explanations : It retards the precombustion of gasoline

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

132. Statements : Enzymes are protein and enzyme catalysed reactions are called biological catalysis .

Explanations : The activity of enzyme as catalyst is increased in presence of vitamins .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: D



Watch Video Solution

133. Statements : Zeolites are water softener as well as catalyst .

Explanations : The catalytic action of zeolites is based upon their shape selectivity .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: D



Watch Video Solution

134. Statements : In catalysis , the entire reaction occurs in a single phase

Explanations : Catalytic action of a surface depends on its adsorption of the reactants .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: B



Watch Video Solution

135. Statements : A catalyst can be poisoned by a small amounts of foreign substances .

Explanations : Poison and reactants compete for the available catalyst surface .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not
correct explanation of S.

Answer: C



Watch Video Solution

136. Statements : Colloidal silver iodide is
sensitive . When subjected to an electric field
the colloidal particles migrate to the anode .

Explanation : Colloidal particles of AgI adsorb
iodide ions and thus become electrically
charged .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

137. Statements : A catalyst doesnot alter the equilibrium constant os a reaction .

Expabnations : A catalyst complex with the reactants and provides an alternate path wirh a lower energy of activation for the reacton .

The forward and reverse reactions are affected to the same extent .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: D



Watch Video Solution

138. Statements : Haber's synthesis of NH_3 is carried out in the presence of a catalyst .

Expabnations :The catlyst shifts the positon of the equilibrium reaction .

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: A



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139. Statements : In the presence of promoter, the activity of the catalyst is enhanced ..

Explanation : The promoter increases the surface area of the catalyst and thus enhancing the number of active centres .

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not
correct explanation of S.

Answer: C



Watch Video Solution

140. Statements : A catalyst enhances the rate of a reaction .

Explanation : The energy of activation of the reaction is lowered in presence of a catalyst of the catalyst ion.

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

141. Statements : A colloid gets coagulated by addition of an electrolyte ..

Explanation : The rate of coagulation depends on the magnitude and sign of the charge of the coagulant ion.

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not
correct explanation of S.

Answer: D



Watch Video Solution

142. Statements : A colloidal state , a dispersion of a dispersed phase in a dispersion medium is a heterogeneous state. .

Explanation : The particle size of dispersed phase ranges between true solution and suspension state.

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

143. Statements : The stability of lyophobic sol is lesser than lyophilic sol.

Explanations : Lyophilic sol possess loving nature for liquid.

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not
correct explanation of S.

Answer: C



Watch Video Solution

144. Statements : The charge on lyophobic particles is responsible for their nature to exist as sol ..

Explanation : it is the formation of thin layer round sol particles which is responsible for stability of lyophilic sols .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: D



Watch Video Solution

145. Statements : The separation of insoluble impurities from a colloidal solution requires dialysis .

Expabnations : The ionic impurites present in

collidal solution are separated by electrodialysis .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: B



Watch Video Solution

146. Statements : The blue colour of sky is due to scattering of light by dirt or dust particles present in air .

Explanation : Larger size of dispersed phase particles show more scattering as well as higher is the wavelength of light lesser is scattering .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

147. Statements : A yeellow colured As_2S_3 sol on mixing with red colured $Fe(OH)_3$ sol gives colsurless soltion .

Expabnations : The -ve charge os As_2S_3 sol particles is neutralised by +ve charge of $Fe(OH)_3$ sol particles and thus sols are destabilized and show mutual coagulation .

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

148. Statements : Gelation is often used as protective colloid.

Explanation : Protection is a property of lyophilic colloids .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: D



Watch Video Solution

149. Statements : $C_{12}H_{25}NH_3Cl$ and $C_{12}H_{25}COONa$ are collidal enrtroluyte .

Expanations : The substabnces which behae as electolyte at lower concentration and above definite concentration forms sol are called collidal electrolyte .

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

150. Statements : The micelle formation by a surfactant takes places at certain concentration at definite temperature .

Expabnations : The temperature above which a surfactant forms micells is called Kraft point .

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: D



Watch Video Solution

151. Statements : The concentration of sulphide ores by froth floatation is based on emulsification .

Expabnations : Pine oil in water forms emulsion .

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

152. Statements : The digestion of fat in intestine involves emulsification

Expabnations : Bile salts stabilize the emulsion so formed .

A. S is correct but E is wrong .

B. S is worong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: C



Watch Video Solution

153. Statements : Fe^{3+} ions can be used for the coagulation of As_2S_3 so.

Explanations : Fe^{3+} ions react with As_2S_3 to give Fe_2S_3 .

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct
explanation of (S) .

D. Both S and E are correct but E is not
correct explanation of S.

Answer: A



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Exercise 1 A

1. Which plot is the adsorption isobar for chemisorption where m (at constant pressure) at temperature T ?

A. `

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B. `

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C. `

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D. `

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Answer: C



View Text Solution

2. The number of millimole of sodium chloride and each of two sols . S and Y are as follows :

	X	Y
$NaCl$	51	46
$MgCl_2$	71	23

Which of the following would not be reasonable value to expect for the amount of the other salt required to cause precipitation .

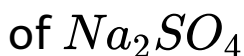
A. X will be precipitated by 90 millimoles of



B. Y will be precipitated by 20 millimoles of



C. X will be precipitated by 25 millimoles



D. Y will be precipitated by 20 millimoles of



Answer: C



View Text Solution

Exercise 4

1. The activity of a catalyst has been explained in terms of spontaneous adsorption of reactant molecule on the surface of catalyst and then by forming an activated adsorbed complex along with evolution of heat. The adsorbed activated complex undergoes decomposition to regenerate catalyst and give products. Adsorption is of two types :

(i) Physical adsorption due to van der Waals' forces of attraction between reactant and

catalyst molecules , weak , less exothermic, multilayer and non-directional .

(ii) Chemical adsorption due to free valencies , strong, more exothermic, unilayer. The extent of adsorption (x/m) vs temperature at constant pressure gives isobars. Freundlich studied influence of pressure on the physical adsorptions and reported that $\log \frac{x}{m} = \log K + \frac{1}{n} \log P$.

Select the correct statements .

A. I, III, IV

B. I, II, III

C. II, III, IV

D. I, II, IV

Answer: a



View Text Solution

2. The activity of a catalyst has been explained in terms of spontaneous adsorption of reactant molecule on the surface of catalyst and then by forming an activated adsorbed complex along with evolution of heat. The

adsorbed activated complex undergoes to decomposition to regenerate catalyst and give products. Adsorption is of two types :

(i) Physical adsorption due to van der Waal's forces of attraction between reactant and catalyst molecules, weak, less exothermic, multilayer and non-directional.

(ii) Chemical adsorption due to free valencies, strong, more exothermic, unilayer. The extent of adsorption (x/m) vs temperature at constant pressure gives isobars. Freundlich studied influence of pressure on the physical adsorptions and reported that \log

$$\frac{x}{m} \log K + \frac{1}{n} \log P.$$

Select the correct statements .

A. I, II, III

B. I, II, IV

C. II, III, IV

D. I, II

Answer: a



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3. The activity of a catalyst has been explained in terms of spontaneous adsorption of reactant molecule on the surface of catalyst and then by forming an activated adsorbed complex along with evolution of heat. The adsorbed activated complex undergoes decomposition to regenerate catalyst and give products. Adsorption is of two types :

(i) Physical adsorption due to van der Waals' forces of attraction between reactant and catalyst molecules, weak, less exothermic, multilayer and non-directional.

(ii) Chemical adsorption due to free valencies , strong, more exothermic, unilayer. The extent of adsorption (x/m) vs temperature at constant pressure gives isobars. Freundlich studied influence of pressure on the physical adsorptions and reported that $\log \frac{x}{m} = \log K + \frac{1}{n} \log P$.

Select the correct statements .

A. I, II, IV

B. I, II, III

C. II, III, IV

D. I,II

Answer: b



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Exercise 5

1. Statements : Oxidation of Na_2SO_3 is not caused by air but in presence of Na_3AsO_3 both undergo oxidation simultaneously .

Explanations : Neither $NaSO_3$ nor Na_2SO_3 is oxidised by air.

A. S is correct but E is wrong .

B. S is wrong but E is correct

C. Both S and E are correct and E is correct explanation of (S) .

D. Both S and E are correct but E is not correct explanation of S.

Answer: A



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