



CHEMISTRY

BOOKS - BITSAT GUIDE

ADSORPTION AND COLLOIDAL SYSTEM

Practice Exercise

1. The substance that adsorbed gets adsorbed on the surface of the solid is called

A. adsorbate

B. adsorbent

C. micelle

D. inner phase

Answer: A



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2. Adsorption is multilayer in case of :

A. physical adsorption

B. chemisorption

C. Both (a) and (b)

D. None of these

Answer: A



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3. Which is correct in case of van der Waals adsorption?

- A. High temperature, low pressure
- B. Low temperature, high pressure
- C. Low temperature, low pressure
- D. High temperature, high pressure

Answer: B



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4. the nature of bonding forces in adsorption are:

A. ionic

B. covalent

C. van der waals'

D. H-bonding

Answer: C



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5. Which adsorption takes place at higher temperatures?

A. physical

B. Chemical

C. Both (a) and (b)

D. None of these

Answer: B



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6. Which is adsorbed in minimum amount by the activated charcoal?

A. H_2

B. CO_2

C. SO_3

D. CO

Answer: A



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7. Which of the following gas is adsorbed in maximum amount by charcoal?

A. SO_2

B. CO_2

C. CO

D. Water vapour

Answer: A



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8. which one of the following is not applicable to chemisorption ?

A. It is reversible in nature

B. It is usually occurs at low tempertures

C. It is highly specific forces in nature

D. The attractive forces between adsorbate and adsorbent are van dar Waals' forces

Answer: C



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9. Adsorption is accompanied by

- A. decrease in entropy
- B. decrease in enthalpy
- C. decrease in free energy
- D. None of these

Answer: D



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10. Amount of gas adsorbed per gram of adsorbent increases with pressure, but after a certain limit is reached, adsorption becomes constant. It is where

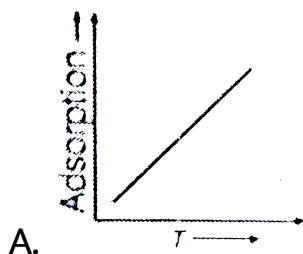
- A. multilayers are formed

- B. desorption takes place
- C. temperature is increased
- D. adsorption also starts

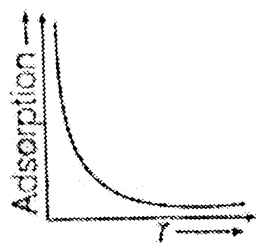
Answer: A

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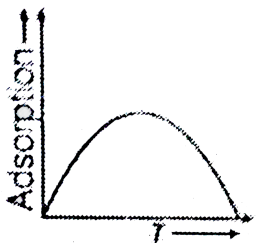
11. Following is the variation of physical adsorption with temperature.



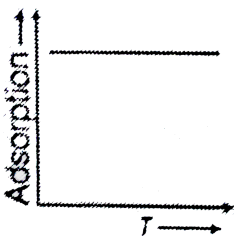
B.



C.



D.



Answer: B



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

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

B. $\frac{x}{m} \propto P^1$

C. $\frac{x}{m} \propto P^{1/n}$

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

Answer: D



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13. 1g charcoal is placed in 100mL of 0.5M CH_3COOH to form an adsorbed mono-layer of acetic acid molecule and thereby the molarity of CH_3COOH reduces to 0.49. Calculate the surface area of charcoal adsorbed by each molecule of acetic acid. Surface area of charcoal = $3.01 \times 10^2 m^2 / g$.

A. $6.02 \times 10^{-30} m^2$

B. $5.00 \times 10^{-19} m^2$

C. $3.01 \times 10^{-2} m^2$

D. $2.00 \times 10^{-19} m^2$

Answer: B



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14. Which of the following is not the true about the adsorption?

- A. During the process of adsorption, residual decreases forces decreases
- B. During the adsorption surface energy decreases
- C. It is an exothermic process
- D. It is a an endothermic process

Answer: D



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15. Which of the following statements are correct?

I. Silica gel adsorbs water molecules. , II. Anhy. $CaCl_2$ adsorbs the water molecules. , III. Adsorption is a surface phenomenon.

A. I and II

B. II and III

C. I and III

D. All of these

Answer: B



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16. Which of the following process will be observed, when a chalk stick is dipped in the solution of ink?

- A. Adsorption
- B. Absorption
- C. Desorption
- D. Both (a) and (b)

Answer: D



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17. A mixture of sand and water is an example of

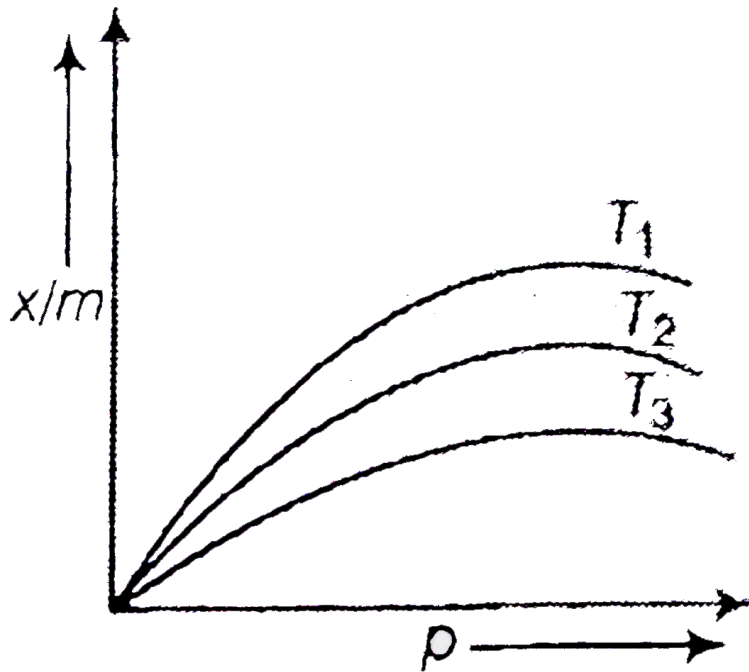
- A. true solution
- B. colloidal solution
- C. suspension
- D. All of the above

Answer: C



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18. Freundlich adsorption isotherm is represented at temperatures T_1 , T_2 and T_3 .



Arrange the temperatures in the increasing order as shown in the graph.

A. $T_1 < T_2 < T_3$

B. $T_3 < T_2 < T_1$

C. $T_2 < T_3 < T_1$

D. $T_3 < T_1 < T_2$

Answer: A



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19. Identify the gas which is readily adsorbed by activated charcoal?



Answer: C



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20. "Rate of adsorption is directly proportional to the fraction of area uncovered and rate of desorption is directly proportion to the fraction of area covered". This statement is true for

- A. Freundlich adsorption isotherm
- B. Langmuir adsorption isotherm
- C. BET isotherm
- D. None of the above

Answer: A



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21. Which of the following expressions describes Freundlich adsorption isotherm?

A. $\log\left(\frac{x}{m}\right) = \log k + \frac{1}{n}\log p$

B. $\log\left(\frac{m}{x}\right) = \log k + \frac{1}{n}\log p$

C. $\log\left(\frac{x}{m}\right) = \log p + \frac{1}{K}\log p$

D. $\log\left(\frac{x}{m}\right) = \log c + \frac{1}{n}\log K$

Answer: A



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22. Which of the following is correct statement?

- A. Physisorption occurs at low temperature and chemisorption occurs at high temperature
- B. Physisorption occurs at vary high temperature and chemisorption occurs at low temperature
- C. Physisorption is irreversible and chemisorption is reversible
- D. None of the above

Answer: A



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23. For Freundlich adsorption isotherm, $\frac{x}{m} = kp^1/n$,
the value of n is

A. awlays greater tham 1

B. always smaller than 1

C. always equal to 1

D. greater than 1 at low temperature and smaller than 1 at high temperatute

Answer: A



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24. In general, H_2 gas is adsorbad on activated charcoal to a less extent in comparison to the easily liquefiable gases due to

A. very strong van der waals' force and low critical temperature

B. very weak van der waals' force and low critical temperature

C. very strong van der waals' force and high critical temperature

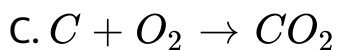
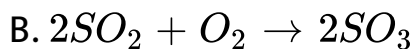
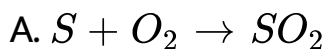
D. very weak van der waals' force and high temperetura

Answer: B



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25. Which requires catalyst ?



D. All of the above

Answer: B



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26. The enzyme that converts cane sugar into invert sugar (a mixture of glucose and fructose) is

A. invertase

B. zymase

C. lactic bacilli

D. diastase

Answer: A



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27. The efficiency of an enzyme in catalysing a reaction is due to its capacity

A. to form an enzyme substrate complex

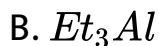
- B. to decreases the bond energies of the substrate molecules
- C. to change the shape of the sobstrate molecule
- D. None of the above

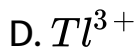
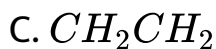
Answer: A



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28. In Zeigler-Natta polymerisation of ethylene, the active species is





Answer: D



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29. Following reaction is catalysed by Br^-



This is an example of

A. homogeneous catalysis

B. heterogenous catalysis

C. Both (a) and (b)

D. None of these

Answer: A



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30. Vanishing cream is an example of

A. solution

B. foam

C. lyophilic solution

D. emulsion

Answer: D



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31. colloidal solution of gold is prepared by :

- A. colloidal mill
- B. double decomposition method
- C. Bredig's are method
- D. peptisation

Answer: C



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32. When a beam of light is passed through colloidal solution.

- A. it gets scattered
- B. it gets adsorbed
- C. it is refracted
- D. it undergoes reflection

Answer: A



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33. Fog is a colloid consisting of

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

D. None of these

Answer: C



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34. Which property is not shown by colloids?

A. Adsorption

B. Tyndall effect

C. Flocculation

D. Paramagnetism

Answer: D



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35. The path of a beam of light through smoke is visible because

- A. carbon dioxide in the smoke scatters light
- B. carbon dioxide in the smoke absorbs light
- C. carbon particles in the smoke absorb light
- D. carbon particles in the smoke scatter light

Answer: D



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36. Four different colloids have the following gold number, which one has most effective action?

A. 10

B. 30

C. 20

D. 40

Answer: A



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37. For coagulating As_2S_3 colloidal sol, which of the following will have the lowest coagulation value

A. NaCl

B. KCl

C. BeCl_2

D. AlCl_3

Answer: D



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38. Which of the following indicates the charge on colloidal particles?

A. Brownian movement

B. Electrophoresis

C. Electrolysis

D. Tyndall effect

Answer: B



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39. Which of the following is not a colloid?

A. Milk

B. Blood

C. Latex

D. Vinegar

Answer: D



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40. Colloidal dispersion have been classified into different types depending upon the physical state of the dispersed phases and the dispersion medium. They are prepared in the industry or in the laboratory by a number of methods and then purified. The protective action of lyophilic colloids was studied by Zsigmondy and he introduced a term called gold number.

Which of the following has minimum gold number?

A. Gelatin

B. Egg albumin

C. Gum arabic

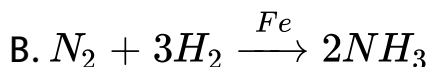
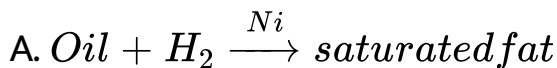
D. Starch

Answer: A

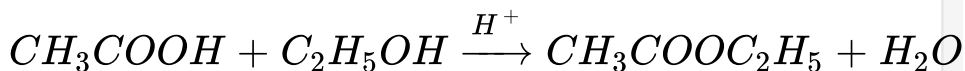


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41. Which of the following represents homogeneous catalysis?



C.



D. None of the above

Answer: C



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42. Which one of the following substance is not a colloid?

A. Chlorophyll

B. Smoke

C. Ruby glass

D. Milk

Answer: A



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43. the stability of lyophilic colloids is due to

- A. Lyophilic on the particles
- B. large size of particles
- C. small size of particles
- D. layer of dispersion medium on the particle

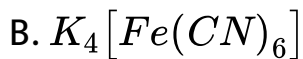
Answer: D



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44. Which has the maximum coagulating power for ferric hydroxide colloid?

- A. $AlCl_3$



Answer: B



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45. Gold number is the index for

A. Protective power of lyophilic colloid

B. purity of gold

C. metallic gold

D. electropated gold

Answer: A



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46. The blue colour of the sky is due to

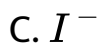
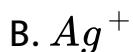
- A. scattering of light from the sun
- B. scattering of light from particles of dust in the atmosphere
- C. refraction of blue light by impurities in sea water
- D. scattering of the light due to ozone layer

Answer: B



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47. Which to KI solution, positively charged sol particles of AgI are formed due to adsorption of ion



Answer: B



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48. Gold sol and sulphur sols are the examples of

- A. multimolecular colloids
- B. macromolecular colloids
- C. associated colloids
- D. All of the above

Answer: A



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49. Colloidion is a

- A. 100 % solution of nifrocellulose
- B. 10 % solution of nifrocellulose in mixture of alcohol and ether

C. 4 % solution of nifrocellulose in mixture of alcohol and ether

D. 1 % solution of nifrocellulose in mixture of alcohol and ether

Answer: C



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50. Lyophilic solutino is coagulted by

A. adding an electrolyte

B. adding a suitable solvent

C. Both (a) and (b)

D. None of the above

Answer: C



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1. The gold number of a few protective colloids are given

$$x = 0.005, y = 3.5, z = 40$$

The protective nature to these colloidal solutions follow the order:

A. $z > x > y$

B. $x < y < z$

C. $z > y > x$

D. $x > y > z$

Answer: D



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2. equal volume each of two sols of AgI, one obtained by adding $AgNO_3$ to slight excess of KI and another obtained by adding KI to slight excess of $AgNO_3$ are mixed together . Then :

A. the sol particles acquired more electric charge

B. the sol coagulated each other mutually

C. a true solution is obtained

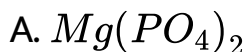
D. the two sols stabilised each other

Answer: B



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3. Which of the following will be the most effective in the coagulation of $Fe(OH)_3$ sol ?



Answer: A



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4. Which of the following is an example of homogeneous catalysis?

A. Haber's process for the synthesis of NH_3

B. Catalytic conversion of $SO_2 \rightarrow SO_3$ in contact process

C. Catalytic hydrogenation of oils

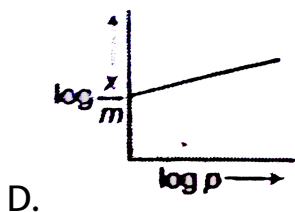
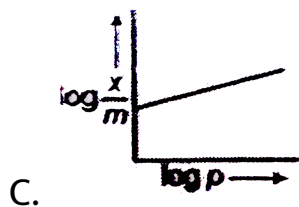
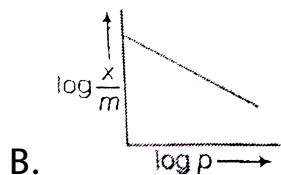
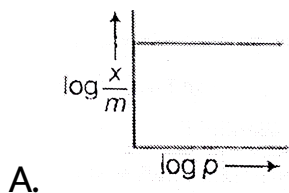
D. Acid hydrolysis of methyl acetate

Answer: D



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5. Which of the following graphs represents freundlich adsorption isotherm?



Answer: C



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