



CHEMISTRY

BOOKS - SHARAM PUBLICATION

SURFACE CHEMISTRY

Exercise

1. Which of the following is not colloid ?

A. Chlorophyll

B. Smoke

C. Milk

D. Fog

Answer:



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2. Fog is an example of colloidal system of

A. Liquid dispersed in gas

B. Gas dispersed in liquid

C. Solid dispersed in liquid

D. Solid dispersed in gas

Answer:



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3. An Arsenous sulphide sol carries a negative charge. The maximum precipitating power for this sol is possessed by

A. K_2SO_4

B. $CaCl_2$

C. Na_3PO_4

D. $AlCl_3$

Answer:



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4. The Brownian motion is due to

A. Temperature fluctuation within the liquid phase

B. Attraction and repulsion between the charges on colloidal particles

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

D. Convection current

Answer:



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5. Tyndall effect in colloidal solution is due to

A. Scattering of light

B. Reflection of light

C. Absorption of light

D. Presence of electrically charged particles

Answer:



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6. Which of the following will have highest coagulating power on a negatively charged sol

?



Answer:



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7. Which of the following substances gives a positively charged sol?

A. Gold sol

B. Metal sulphide sol

C. Fe (OH)₃ sol`

D. An acid dye

Answer:



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8. Give an example of emulsion.

A. jelly

B. Boot polish

C. Froth

D. Milk

Answer:



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9. In physisorption, the molecules of adsorbate held to the adsorbent by

A. vander Waal's force

B. Electrical force

C. Chemical bond

D. None of these

Answer:



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10. A negatively charged suspension of clay in water will need for precipitate the minimum amount of

A. $AlCl_3$

B. K_2SO_4

C. $NaOH$

D. HCl

Answer:



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11. In colloidal state, particle size ranges from :

A. $1^\circ \rightarrow 10A^\circ$

B. $20 \rightarrow 50A^\circ$

C. $10 - 1000A^\circ$

D. $1 - 500A^\circ$

Answer:



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12. Gold number is the measure of the

A. Protective action of lyophilic colloid on
lyophobic colloid.

B. Protective action of lyophobic colloid on lyophilic colloid

C. Number of milligrams of gold in standard red gold sol

D. Stability of gold sol

Answer:



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13. If dispersed phase is a liquid and the dispersion medium is a solid the colloid is known as :

A. A sol

B. A Gel

C. An emulsion

D. A foam

Answer:



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14. Cow milk is an example of natural emulsion, it is stabilised by

A. Fat

B. Water

C. Casein

D. Mg^{3+} ion

Answer:



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15. Which of the following statement regarding the catalyst is not true.

A. It remains unchanged at the end of the reaction

B. It can initiate the reaction

C. It does not alter the equilibrium in a reversible reaction

D. It is very specific in terms of reaction

Answer:



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16. Gelatine is mostly used in making ice creams in order to

A. Prevent making of a colloid

B. Stabilize the colloid and prevent crystallisation

C. Stabilize the mixture

D. Enrich the arome.

Answer:



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17. Butter is a colloid formed when

- A. Fat is dispersed in water
- B. Fat globules are dispersed in water
- C. Water is dispersed in water
- D. None of the above

Answer:



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18. On adding a few drops of dil. HCl to freshly precipitated $Fe(OH)_3$, a red colour colloidal solution is obtained. The phenomenon is known as

- A. Peptization
- B. Dialysis
- C. Protective action
- D. Dissolution

Answer:



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19. The presence of electrical charge on the colloidal particle is indicated by the experiment.

A. Osmosis

B. Electrolysis

C. Dialysis

D. Electrophoresis

Answer:



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20. An example of micell is

A. Sodium stearate

B. Gold sol

C. *NaCl* sol

D. Rubby glass

Answer:



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21. Alum purifies muddy water by

A. Dialysis

B. Adsorption

C. Coagulation

D. Absorption

Answer:



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22. $FeCl_3$ is applied to stop bleeding from the cut because

A. Fe^{3+} ion coagulates blood which is

-vely charged

B. Fe^{3+} ion coagulates blood which is +

vely charged

C. Cl^{-} ion coagulates blood which is +vely

charged sol.

D. Cl^- ion coagulates blood which is -vely charged sol.

Answer:



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23. The zig - zag motion of colloidal particles was first observed by

A. John Tyndal

B. Robert Brown

C. Zsigmondy

D. Ostwald

Answer:



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24. Collodian is a colloidal solution of

A. Sucrose in water

B. Cellulose in water

C. Cellulose nitrate in water in water

D. Cellulose nitrate in ethanol

Answer:



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25. Chromatography is based on

A. Selective absorption

B. Selective adsorption

C. Sorption

D. Peptization

Answer:



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26. Soap form colloidal solution in water and removes grease from clothes by

- A. Coagulation
- B. Emulsification
- C. Adsorption
- D. Absorption

Answer:



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27. On addition of 1 mL solution of 10% NaCl to 10 mL gold sol in the presence of 0.0250 g of starch, the coagulation is just prevented. What is the gold number of starch?

A. 0.025

B. 0.25

C. 2.5

D. 25

Answer:



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28. When a colloidal solution is observed under microscope we can see

- A. Light scattering by colloidal particles
- B. Size of colloidal particles
- C. Shape of colloidal particles

D. Relative Size of colloidal particles

Answer:



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29. Lyophilic sols are

A. Irreversible sols

B. prepared from inorganic compounds

C. coagulated by adding electrolyte

D. self - stabilizing

Answer:



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30. Rate of phsiosorption increase with

- A. Decrease in temperature
- B. Increase in temperature
- C. Decrease in pressure
- D. Decrease in surface area

Answer:



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31. Gold number of protective colloids A, B, C and D are 0.50, 0.01, 0.10 and 0.005 respectively. The correct order of their protective power is

A. $D < A < C < B$

B. $C < B < D < A$

C. $A < C < B < D$

D. $B < D < A < C$

Answer:



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32. Among the following electrolytes:

Na_2SO_4 , $CaCl_2$, $Al_2(SO_4)_3$, , NH_4Cl

which is the most effective coagulating agent for Sb_2S_3 solution?

A. Na_2SO_4

B. $CaCl_2$

C. $Al_2(SO_4)_3$

D. NH_4Cl

Answer:



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33. Adsorption is multilayer in case of

A. Physical adsorption

B. Chemical adsorption

C. both physical and chemical adsorption

D. None

Answer:



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34. Which of the following can act as a protective colloid?

A. Gelatin

B. Silica Gel

C. Oil- in water emulsion

D. All three

Answer:



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35. In foams , the dispersed phase and dispersion medium are

- A. Gas and liquid
- B. Gas and solid
- C. Liquid and gas
- D. Solid and Gas

Answer:



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36. The function of gum arabic in the preparation of Indian ink is

- A. Coagulation
- B. Peptization
- C. Protective action
- D. Adsorption

Answer:



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37. The term sorption stands for

A. Adsorption

B. Absorption

C. Both adsorption and absorption

D. Desorption

Answer:



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38. Adsorption is accompanied by:

A. Decrease in enthalpy and increase in entropy

B. Increase in enthalpy and increase in entropy

C. Decrease in enthalpy and decrease in entropy

D. No change in enthalpy or entropy

Answer:



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39. Which of the following is not correctly matched ?

- A. Butter - Gel
- B. Milk - emulsion
- C. Fog - aerosol
- D. Dust - solid sol

Answer:



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40. At high concentration of soap in water, the soap behaves as

- A. Molecular colloid
- B. Associated colloid
- C. Macromolecular colloid
- D. Lyophilic colloid

Answer:



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41. What are emulsifiers ?



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42. Between a lump of charcoal and charcoal powder of same mass which is a better adsorbent ?



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43. What is the effect of temperature on physical adsorption ?



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44. What are lyophilic and lyophobic sols? Give one example of each type. Why are hydrophobic sols easily coagulated?



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45. What is an emulsion ?



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46. Which colloidal system is present in butter ?



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47. What happens when silica gel is placed in water vapours ?



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48. What causes Brownian movement in colloidal solution ?



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49. What is chemisorption ?



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50. What are the dispersed phase and dispersion medium in milk?



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51. What are enzymes ?



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52. Give an example of a shape - selective catalys.



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53. What is the sign of ΔH and ΔS when a gas is adsorbed by an adsorbent ?



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54. What is the value of ΔG at adsorption equilibrium ?



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55. What is the binding force in physisorption?



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56. What is the size of colloidal particles in Å° unit ?



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57. What is the cause of Tyndall effect?



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58. What is especially observed when a beam of light is passed through a colloidal solution?



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59. Give a chemical equation for the preparation of a positive sol of $Fe(OH)_3$.



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60. What is occlusion ?



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61. How does increase of temperature affect physical and chemical adsorption ?



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62. Name the type of colloid of cheese.



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63. Why colloidal solution is heterogeneous?



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64. What is the main cause of charge in colloidal solution ?



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65. Out of KNO_3 and $Al(NO_3)_3$ which one is required in minimum concentration for coagulation of As_2S_3 sol ?



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66. What is the difference between sol and emulsion ?



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67. Name two industrial processes in which heterogeneous catalysts are used.



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68. Between physical and chemical adsorption which has high enthalpy of adsorption ?



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69. Between hydrophobic and hydrophilic colloids which one is easily coagulated ?



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70. How will you purify muddy water ?



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71. Which homogeneous catalyst is used in acid hydrolysis of cane sugar ?



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72. What is the optimum p^H for enzymatic reactions in human body ?



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73. Fill in the blanks : Milk is an example of

.....



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74. Fill in the blanks : The term Gold number was introduced by the scientist



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75. Fill in the blanks : The minimum amount of electrolyte which can precipitate any colloid is called



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76. Fill in the blanks : Gels on long standing loses small amount of liquid. The phenomenon is known as



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77. Fill in the blanks : Moisture is By silica gel but By Anh. $CaCl_2$.



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78. Fill in the blanks : Cod liver oil is an emulsion of In



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79. Fill in the blanks : Blood is a colloidal solution of In water.



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80. Fill in the blanks : The emulsifying agent in milk is



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81. Fill in the blanks : Mist is a colloidal system in which Is dispersed in air.



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82. Fill in the blanks : The transformation of a freshly prepared precipitate into colloidal solution by adding an electrolyte is called



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83. Fill in the blanks : Liquid - liquid colloidal systems are called



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84. Fill in the blanks : The heterogeneous catalyst used in the contact process of manufacture of H_2SO_4 is



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85. Fill in the blanks : Smoke is a dispersion of In



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86. The colloidal system of liquid dispersed in solid is called _____.



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87. Fill in the blanks : The colloidal solution of cellulose nitrate in ethanol is called



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88. Fill in the blanks : Vanishing cream is an example of Type emulsion.



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89. Fill in the blanks : Cold cream is an example of In Type emulsion.



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90. Fill in the blanks : The heat of adsorption in physisorption lies in the range of KJ mol⁽⁻¹⁾



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91. Fill in the blanks : The adsorption of N_2 gas on iron at 83K is Where as at 773k is



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92. Fill in the blanks : The technique of separation of components of a mixture in the solution based on their differential adsorption is called



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93. Fill in the blanks : The type of colloidal dispersion obtained when egg protein is mixed with water is called colloid.



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94. Fill in the blanks : The minimum milligrams of a protective colloid to be added to 10 ml of standard red gold sol, so that no coagulation takes place when 1 ml of 10% $NaCl$ solution is added is called



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95. Fill in the blanks : The swelling of gel in water is called



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96. Fill in the blanks : The formation of micelles take place above a particular concentration called



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97. Fill in the blanks : Increasing the adsorbing power of an adsorbent by subdividing it is called of solid adsorbent.



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98. Write three differences between physical and chemical adsorption.



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99. What are colloids ? How do they differ from crystalloids ?



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100. What are lyophilic and lyophobic colloids

? Give one example of each.



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101. What is the difference between colloidal solution, gel and emulsion ?



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102. What happens when colloidal solution of $Fe(OH)_3$ is mixed with that of As_2S_3 ?



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103. What do you mean by hydrosol and alcosol ?



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104. Why is a colloidal sol stable?



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105. What happens to gold sol if gelatine is added to it ?



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106. Why is gelatine added to ice cream ?



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107. Why is a peptizing agent added to convert a precipitate into colloidal solution?



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108. Why Cottrell's smoke precipitator is fitted at the mouth of chimney used in factories ?



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109. How do the aquasols and solid aerosols differ ?



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110. The adsorption of a gas on the surface of the solid is generally accompanied by decrease in entropy still it is spontaneous , why ?



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111. What causes Brownian movement in colloidal solution ?



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112. What do you mean by a positive and negative catalyst ?



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113. Why are powdered substances more effective adsorbent than their crystalline form ?



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114. What is the difference between multi molecular and macro molecular colloid ?



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115. Give an example where physisorption changes to chemisorption with rise in temperature. Explain the reason for change.



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116. How does it become possible to cause artificial rain by spraying silver iodide on clouds ?



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117. The coagulation of 100 ml of a colloidal solution of gold is completely prevented by addition of 0.25g of starch to it before adding 10 ml of 10% *NaCl* solution. Calculate the gold number of starch.



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118. 50 ml of standard gold sol needs 0.05mg of gelatine for its protection from coagulation - Calculate gold number of gelatine.



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119. Explain the cleansing action of soaps.



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120. Write the differences between true solution , colloidal solution and suspension.



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121. Distinguish between lyophilic and lyophobic colloids.



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122. Write a brief note on Coagulation.



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123. What are the dispersed phase and dispersion medium in the following colloidal

solutions ?

Gel



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124. What are the dispersed phase and dispersion medium in the following colloidal solutions ?

Emulsion



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125. What are the dispersed phase and dispersion medium in the following colloidal solutions ?

Solid foam



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126. What are the dispersed phase and dispersion medium in the following colloidal solutions ?

Foam.





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127. What are the dispersed phase and dispersion medium in the following colloidal solutions ?

Solid sol.



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128. Write the dispersed phase and dispersion medium in the followings : Whipped cream



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129. Write the dispersed phase and dispersion medium in the followings : Fog



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130. Write the dispersed phase and dispersion medium in the followings : Cheese



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131. Write the dispersed phase and dispersion medium of the following colloidal systems.

Smoke



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132. Write the dispersed phase and dispersion medium in the followings : Muddy water.



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133. Write the dispersed phase and dispersion medium in the followings : Lava



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134. Why are hydrophobic colloids easily coagulated than the lyophilic colloids ?



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135. For coagulation of 50 ml of arsenious sulphide sol, 2.5 ml of 1 M $NaCl$ is required.

What is the flocculation value of $NaCl$?



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136. What are Emulsifiers ? How do they stabilize an emulsion ?



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137. What do you mean by Homogeneous and Heterogeneous Catalysis ? Give examples.



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138. Write down the characteristics of Enzyme Catalysts.



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139. Write notes on

Brownian movement



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140. Write notes on

Tyndal effect



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141. Write notes on Emulsion



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142. Write notes on Enzyme catalysis



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143. What do you mean by adsorption ? What are different types of adsorption and how will you differentiate between them?



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144. What is the difference between adsorption and absorption?



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145. Write notes on : Coagulation of Blood



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146. Write notes on

Gold number





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