

**MHT-CET 2020**

1. Which of the following is an example of physisorption ?
- Adsorption of oxygen on platinum.
  - Adsorption of hydrogen gas on nickel catalyst.
  - Adsorption of carbon monoxide on tungsten.
  - Adsorption of acetic acid in solution on activated charcoal.

**MHT-CET 2021**

2. Which from the following pairs of phenomena and its property is NOT correct?
- Absorption - Absorbate remains on the surface of other substance
  - Adsorption - Evolution of heat
  - Adsorption - Depends on temperature
  - Absorption - Bulk phenomenon
3. Which among the following is true for chemisorption?
- Heat of adsorption is in the range of 20-40 KJ mol<sup>-1</sup>
  - It is multimolecular layered
  - Van der Waal forces are involved
  - It is favoured at high temperature up to certain limit

**MHT-CET 2022**

4. Which among the following is an example of sorption?
- charcoal is added to methylene blue solution
  - chalk is dipped in ink
  - hydrogen gas is passed over platinum
  - oxygen gas is passed over finely divided nickel.
5. Which of the following is NOT a characteristics of chemisorption ?
- It is specific
  - Heat of absorption is in the range of 40-200 KJ mol<sup>-1</sup>
  - Formation of multimolecular layer of adsorbate
  - It is irreversible
6. What type of following phenomena is NOT exhibited by adsorption ?
- Exothermic
  - Endothermic
  - Irreversible
  - Bulk

**Factors affecting adsorption of gases on solid, Adsorption isotherm**

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7. Freundlich's equation for adsorption of gas on solid is represented as
- $\frac{x}{m} = Kp^{1/n}$
  - $\frac{m}{x} = Kp^{1/n}$
  - $\frac{x}{m} = Kp^n$
  - $\frac{m}{x} = Kp^n$
8. In Freundlich's adsorption isotherm, when  $\log \left( \frac{x}{m} \right)$  is plotted against  $\log P$ , slope of graph
- K
  - $\frac{1}{K}$
  - n
  - $\frac{1}{n}$

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9. Which of the following statements is correct for physisorption ?
- It involves formation of covalent or ionic bonds.
  - It is favoured at high temperature.
  - It is reversible.
  - It is very specific.
10. What is the value of intercept on y-axis when  $\log \frac{x}{m}$  is plotted against  $P$  in Freundlich isotherm ?
- $\frac{1}{n}$
  - $\log K$
  - $n$
  - $K$
11. Which of the following statements is true for adsorption ?
- It is accompanied by evolution of heat.
  - It is bulk phenomenon.
  - It is independent of surface area.
  - It is dependent of temperature.

### MHT-CET 2022

12. What is effect of pressure on extent of adsorption ?
- increases as pressure increases continuously.
  - decreases as pressure increases.
  - no change in extent of adsorption if pressure increases or decreases.
  - increases at start as pressure increases and then remains constant.
13. Identify correct statement for adsorption.
- There is uniform distribution of matter inside the bulk as well as on the surface of a substance.
  - It is independent of temperature.
  - It is independent of pressure.
  - It is accompanied by evolution of heat.
14. Identify correct statement regarding absorption.
- It depends upon pressure.
  - It is independent of surface area.
  - Absorbed matter is concentrated only at the surface.
  - It depends upon temperature.
15. At what temperature, the maximum volume of nitrogen gas is adsorbed per unit mass of adsorbent against pressure by studying graphical representation ?
- 220 K
  - 195 K
  - 273 K
  - 244 K

### Catalysis, Homogeneous and Heterogeneous Catalysis, Adsorption theory of Heterogeneous Catalysis

### MHT-CET 2019

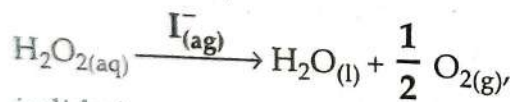
16. For the conversion of oxygen to ozone in the atmosphere, nitric oxide in gaseous phase acts as
- Enzyme catalyst
  - Inhibitor
  - Homogeneous catalyst
  - Heterogeneous catalyst



17. Which among the following processes is an example of homogenous catalysis?
- To obtain ammonia gas in Haber's process.
  - To obtain vanaspathi ghee from vegetable oils.
  - Automobile catalytic converter.
  - Enzyme catalysis in biological system.
18. Which among the following gases is least absorbed at similar conditions of temperature and pressure?
- Cl<sub>2</sub>
  - NH<sub>3</sub>
  - SO<sub>2</sub>
  - H<sub>2</sub>
19. Which among the following gases is adsorbed to greater extent at similar conditions of temperature and pressure if the adsorbent remains same?
- N<sub>2</sub>
  - Cl<sub>2</sub>
  - H<sub>2</sub>
  - O<sub>2</sub>
20. Which of the following is the first step in mechanism of heterogeneous catalysis?
- Desorption of reaction product from catalyst surface.
  - Adsorption of reactant molecule on catalyst.
  - Occurrence of chemical reaction on catalyst surface to form an intermediate.
  - Diffusion of reactants towards catalyst surface.

**Colloids : Classification of colloids, preparation and purification of colloids, properties of colloidal solutions, method of coagulation of colloids**

21. In the reaction,



iodide ion acts as

- Heterogeneous catalyst
  - Homogeneous catalyst
  - Acid catalyst
  - Enzyme catalyst
22. The precipitation power of electrolytes increases with
- Rise in temperature
  - Atomic radius
  - Ionic radius
  - Charge of an ion
23. The ion which has highest precipitation power is
- Mg<sup>++</sup>
  - K<sup>+</sup>
  - Na<sup>+</sup>
  - Al<sup>+++</sup>
24. A colloid of solid in solid is known as
- solid sol
  - aerosol
  - solid foam
  - sol
25. Which of the following is correct for a colloidal dispersion?
- colloidal particle in it possess
  - particles are larger than 10<sup>-4</sup> cm
  - it is heterogeneous
  - dispersion phase are difficult to separate
26. Which of the ionic species has highest precipitation power?
- Al<sup>3+</sup>
  - Cu<sup>+2</sup>
  - Na<sup>+</sup>
  - SO<sub>4</sub><sup>-2</sup>

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27. Electrophoresis is used .....
- to determine charge on colloidal particles.
  - for stability of colloids
  - to count number of particles in colloidal dispersion
  - to determine size of colloidal particles
28. Which of the following can form colloidal sol with water ?
- common salt
  - ammonium sulphate
  - glucose
  - starch
29. Which of the following is an example of hydrophobic sol ?
- cellulose acetate in acetone
  - starch in water
  - metal sulphide
  - rubber in benzene
30. Tyndall effect is observed due to
- neutralisation of charge on colloidal particles
  - precipitation of colloidal particles
  - scattering of light by colloidal particles
  - zig-zag motion of colloidal particles
31. Which of the following ionic species has least precipitation power ?
- $\text{Al}^{3+}$
  - $\text{SO}_4^{2-}$
  - $\text{Mg}^{2+}$
  - $\text{Cl}^-$
32. Identify the enzyme 'X' in the following reaction.
- $$\text{H}_2\text{O}_{2(\text{aq})} \xrightarrow{\text{X}} \text{H}_2\text{O}_{(\text{l})} + \frac{1}{2} \text{O}_{2(\text{g})}$$
- catalyse
  - ferrooxidase
  - amylase
  - carbonic anhydrase
33. Which of the following compounds is formed when tungsten adsorbs oxygen gas?
- Tungsten trioxide
  - Tungsten tetraoxide
  - Tungsten oxide
  - Tungsten dioxide
34. In which of the following sols there is low affinity between dispersed phase and dispersion medium ?
- Rubber in benzene
  - Cellulose acetate in acetone
  - Starch in water
  - Metal sulphide sols
35. Tyndall effect is useful
- for coagulation of colloids
  - for stability of colloids
  - to determine charge on colloidal particles
  - to count number of particles in colloidal dispersion
36. Which of the following processes does not lead to coagulation ?
- Electrophoresis
  - Addition of water to gold sol
  - Heating of egg in boiling water
  - Addition of an electrolyte to sol
37. The capacity of an ion to coagulate a colloidal solution depends on
- Its shape
  - Its atomic mass
  - Its valency
  - Its size
38. Smoke is an example of
- solid sol
  - emulsion
  - foam
  - aerosol