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CHEMISTRY · JEE MAIN

Surface Chemistry

Previous Year Questions with answers

130 questions · **123** papers · **2002–2023** · newest paper first

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What is in this PDF: every Surface Chemistry question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

Step-by-step solutions for every question are free in the EdLoop JEE app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

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Chapter at a glance

2.1%
of Chemistry questions, 2019–2026

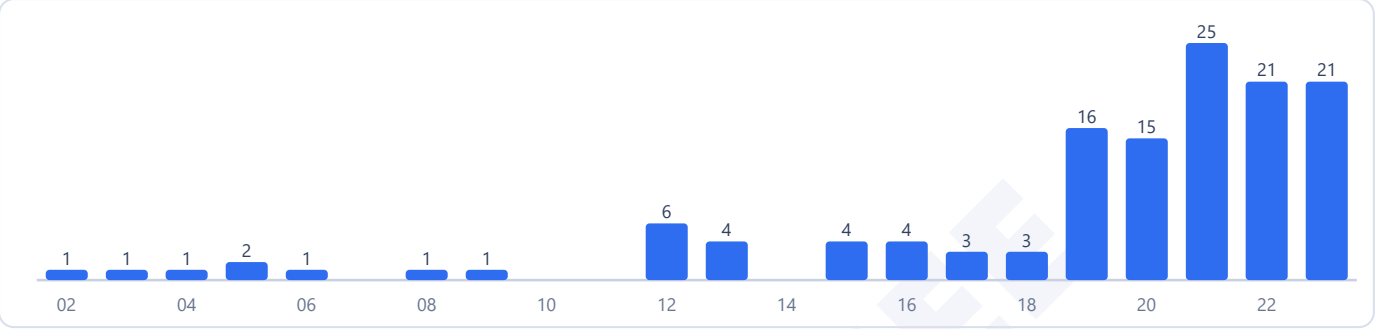
130
questions, 2002–2023

95 of 162
papers asked it, 2019–2026

112 / 18
MCQ / numerical, 2002–2023

Trend. Steady: 0.9 questions per paper in 2021–2023 against 1 in 2019–2020.

Questions per year



Counts are the questions we hold: 130 in 123 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2002–2023)

Colloids	72
Adsorption	46
Catalysis	12

How often it comes up

Surface chemistry studies phenomena at phase boundaries and was formerly in the Class 12 curriculum before being removed in 2024, holding rank 24 of 31 chemistry chapters with a 2.1% share of chemistry questions. Across the 2019 to 2026 timeframe, Surface Chemistry contributed 98 questions across 162 test papers, representing 2.1% of chemistry questions and standing at rank 24 of 31 chapters. Prior to that, from 2002 to 2018, it registered 32 questions across 38 papers with a 2.4% subject share. Following the curriculum reduction in 2024, the chapter saw 0 questions across 58 papers in the 2024 to 2026 period. Consequently, its overall trajectory has trended down.

Because of its removal, the chapter was not asked in 2024, 2025, or 2026. Prior to deletion, the chapter averaged 0.6 questions per paper between 2019 and 2026, including 18 numerical answer questions.

Most-asked topics

Historic papers distributed questions across three specific topics:

- Colloids: Generated 72 total questions (55 during 2019 to 2026), last evaluated in 2023. Areas covered included classification of sols, lyophilic versus lyophobic behaviors, Hardy-Schulze rule for coagulation, electrophoresis, and micelle formation.
- Adsorption: Accounted for 46 total questions (33 during 2019 to 2026), last tested in 2023. Core concepts focused on distinguishing physisorption from chemisorption, thermodynamic parameters (enthalpy and entropy changes), and the Freundlich adsorption isotherm.
- Catalysis: Yielded 12 total questions (10 during 2019 to 2026), last asked in 2023. Questions examined homogeneous and heterogeneous catalysis, enzyme kinetics curves, and intermediate compound theories.

What the questions look like

Past problems were predominantly conceptual and descriptive, demanding accurate recall of terminology. Typical items asked students to contrast physisorption against chemisorption based on reversibility, temperature influence, or enthalpy values. In colloidal systems, questions regularly tested the coagulating power of various electrolytes on positively or negatively charged sols.

Mathematical questions were restricted almost entirely to the Freundlich isotherm equation, evaluating logarithmic plots of x/m versus pressure to deduce constants.

How to practise it

Given the syllabus status, adjust your study schedule thoughtfully:

1. Prioritize active chapters: Since this unit is excluded from the current JEE Main curriculum, dedicate your primary revision hours to high-weight active units. 2. Review basic colloid terms: If preparing for board exams or other competitive assessments, understand Brownian motion, Tyndall effect, and zeta potential. 3. Understand adsorption thermodynamics: Know that adsorption is always exothermic with negative entropy change under spontaneous conditions. 4. Recall the Hardy-Schulze rule: Remember that higher ionic charge corresponds to exponentially greater coagulating power for an oppositely charged sol.

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Q1 JEE Main 2023 · 15 Apr · Shift 1 · Numerical

20 mL of 0.5 M NaCl is required to coagulate 200 mL of As_2S_3 solution in 2 hours. The coagulating value of NaCl is _____.

Numerical value type: the answer is a number.

Answer: 50. · Key from source paper

Q2 JEE Main 2023 · 13 Apr · Shift 1 · MCQ

What happens when a lyophilic sol is added to a lyophobic sol?

(A) Film of lyophilic sol is formed over lyophobic sol
(B) Lyophilic sol is dispersed in lyophobic sol
(C) Film of lyophobic sol is formed over lyophilic sol
(D) Lyophobic sol is coagulated

Answer: (A) Film of lyophilic sol is formed over lyophobic sol · Key from source paper

Q3 JEE Main 2023 · 13 Apr · Shift 2 · MCQ

Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : The diameter of colloidal particles in solution should not be much smaller than wavelength of light to show Tyndall effect.
Reason R : The light scatters in all directions when the size of particles is large enough.
In the light of the above statements, choose the correct answer from the options given below :

(A) Both A and R are correct but R is NOT the correct explanation of A
(B) A is true but R is false
(C) A is false but R is true
(D) Both A and R are correct and R is the correct explanation of A

Answer: (D) Both A and R are correct and R is the correct explanation of A · Key from source paper

Q4 JEE Main 2023 · 12 Apr · Shift 1 · MCQ

Four gases, A, B, C and D have critical temperatures 5.3, 33.2, 126.0 and 154.3K respectively
For their adsorption on a fixed amount of charcoal, the correct order is :

(A) C > D > B > A
(B) C > B > D > A
(C) D > C > B > A
(D) D > C > A > B

Answer: (C) D > C > B > A · Key from source paper

Q5 JEE Main 2023 · 11 Apr · Shift 2 · Numerical

The number of correct statements about modern adsorption theory of heterogeneous catalysis from the following is _____

A. The catalyst is diffused over the surface of reactants.

B. Reactants are adsorbed on the surface of the catalyst.

C. Occurrence of chemical reaction on the catalyst's surface through formation of an intermediate.

D. It is a combination of intermediate compound formation theory and the old adsorption theory.

E. It explains the action of the catalyst as well as those of catalytic promoters and poisons.

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q6 JEE Main 2023 · 10 Apr · Shift 1 · MCQ

The enthalpy change for the adsorption process and micelle formation respectively are

(A) $\Delta H_{\text{ads}} > 0$ and $\Delta H_{\text{mic}} < 0$

(B) $\Delta H_{\text{ads}} > 0$ and $\Delta H_{\text{mic}} > 0$

(C) $\Delta H_{\text{ads}} < 0$ and $\Delta H_{\text{mic}} > 0$

(D) $\Delta H_{\text{ads}} < 0$ and $\Delta H_{\text{mic}} < 0$

Answer: (C) $\Delta H_{\text{ads}} < 0$ **and** $\Delta H_{\text{mic}} > 0$ · Key from source paper

Q7 JEE Main 2023 · 10 Apr · Shift 2 · MCQ

Ferric chloride is applied to stop bleeding because

(A) Blood absorbs $\mathrm{FeCl_3}$ and forms a complex.

(B) $\mathrm{Cl^-}$ ions cause coagulation of blood.

(C) $\mathrm{Fe^{3+}}$ ions coagulate blood which is a negatively charged sol.

(D) $\mathrm{FeCl_3}$ reacts with the constituents of blood which is a positively charged sol.

Answer: (C) $\mathrm{Fe^{3+}}$ **ions coagulate blood which is a negatively charged sol.** · Key from source paper

Q8 JEE Main 2023 · 8 Apr · Shift 1 · MCQ

Which of the following represents the Freundlich adsorption isotherms?

(A) *(see the figure above)*

(B) *(see the figure above)*

(C) *(see the figure above)*

(D) *(see the figure above)*

Choose the correct answer from the options given below:

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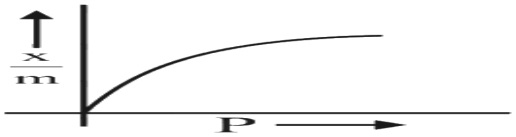
Q48. Which of the following represents the Freundlich adsorption isotherms?

(A)

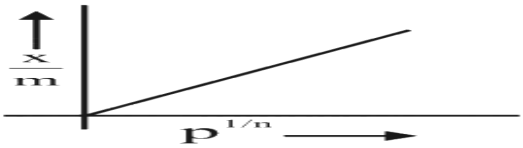


(B)





(C)



(D)

Choose the correct answer from the options given below:

(1) A, C, D only (2) A, B only

(3) B, C, D only (4) A, B, D only

(A) A, C, D only

(B) A, B only

(C) B, C, D only

(D) A, B, D only

Answer: (D) A, B, D only · Key from source paper

Q9 JEE Main 2023 · 8 Apr · Shift 2 Numerical

Coagulating value of the electrolytes $AlCl_3$ and NaCl for As_2S_3 are 0.09 and 50.04 respectively. The coagulating power of $AlCl_3$ is x times the coagulating power of NaCl. The value of x is

Numerical value type: the answer is a number.

Answer: 556. · Key from source paper

Q10 JEE Main 2023 · 6 Apr · Shift 2 Numerical

The number of colloidal systems from the following, which will have 'liquid' as the dispersion medium, is _____ .

Gem stones, paints, smoke, cheese, milk, hair cream, insecticide sprays, froth, soap lather

Numerical value type: the answer is a number.

Answer: 5. · Key from source paper

Q11 JEE Main 2023 · 1 Feb · Shift 1 MCQ

Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: Amongst He, Ne, Ar and Kr; 1 g of activated charcoal adsorbs more of Kr.

Reason R: The critical volume V_c ($cm^3\ mol^{-1}$) and critical pressure P_c (atm) is highest for Krypton but

the compressibility factor at critical point Z_c is lowest for Krypton.
In the light of the above statements, choose the correct answer from the options given below.

(A) A is true but R is false
(B) A is false but R is true
(C) Both A and R are true but R is NOT the correct explanation of A
(D) Both A and R are true and R is the correct explanation A

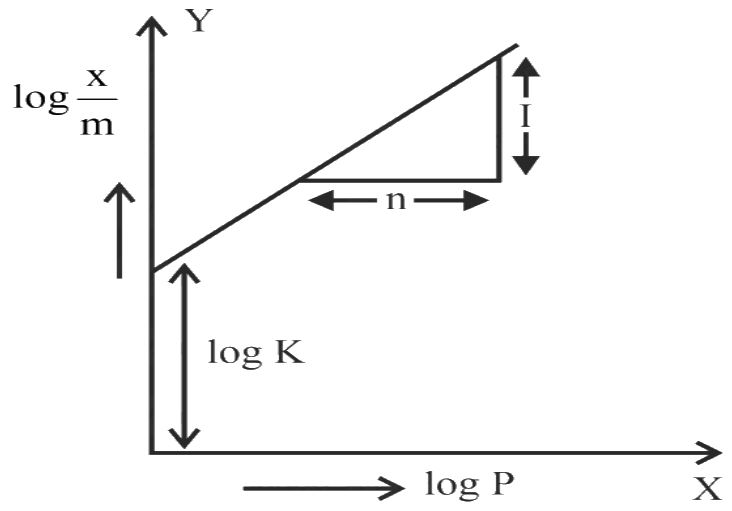
Answer: (A) A is true but R is false · Key from source paper

Q12 JEE Main 2023 · 1 Feb · Shift 2 MCQ

In figure, a straight line is given for Freundrich Adsorption (y = 3x + 2. 505). The value of $\frac{1}{n}$ and logK are respectively.

(see the figure above)

Q50. In figure, a straight line is given for Freundrich Adsorption ($y = 3x + 2.505$). The value of $\frac{1}{n}$ and logK are respectively.



(1) 0. 3 and log 2. 505
(2) 0. 3 and 0. 7033
(3) 3 and 2. 505
(4) 3 and 0. 7033

(A) 3 and log 2. 505
(B) 3 and 0. 7033
(C) 3 and 2. 505
(D) 3 and 0. 7033

Answer: (C) 3 and 2. 505 · Key from source paper

Q13 JEE Main 2023 · 31 Jan · Shift 1 MCQ

Adding surfactants in non polar solvent, the micelles structure will look like
(a)
(see the figure above)

(b)

(see the figure above)

(c)

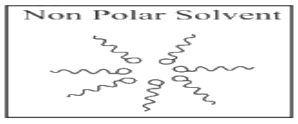
(see the figure above)

(d)

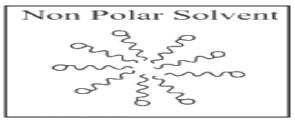
(see the figure above)

Q38. Adding surfactants in non polar solvent, the micelles structure will look like

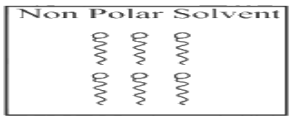
(a)



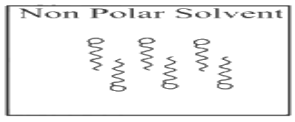
(b)



(c)



(d)



(1) b (2) c
(3) a (4) d

(A) b

(B) c

(C) a

(D) d

Answer: (C) a · Key from source paper

Q14 JEE Main 2023 · 31 Jan · Shift 2 MCQ

Match List I with List II

List I

A Physisorption

B Chemisorption

C $\mathrm{N_2(g) + 3H_2(g) \xrightarrow{Fe(s)} 2\,NH_3(g)}$

D Analytical Application or Adsorption

List II

I Single Layer Adsorption

II $20 - 40$ kJ $\mathrm{mol^{-1}}$

III Chromatography

IV Heterogeneous catalysis

Choose the correct answer from the options given below:

(A) A-III, B-IV, C-I, D-II

(B) A-II, B-III, C-I, D-IV

(C) A-II, B-I, C-IV, D-III

(D) A-IV, B-II, C-III, D-I

Answer: (C) A-II, B-I, C-IV, D-III · Key from source paper

Q15 JEE Main 2023 · 30 Jan · Shift 1 MCQ

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): In expensive scientific instruments, silica gel is kept in watch-glasses or in semipermeable membrane bags.

Reason (R): Silica gel adsorbs moisture from air via adsorption, thus protects the instrument from water corrosion (rusting) and / or prevents malfunctioning.

In the light of the above statements, choose the correct answer from the options given below:

(A) (A) is false but (R) is true

(B) (A) is true but (R) is false

(C) Both (A) and (R) are true and (R) is the correct explanation of (A)

(D) Both (A) and (R) are true but (R) is not the correct explanation of (A)

Answer: (C) Both (A) and (R) are true and (R) is the correct explanation of (A) · Key from source paper

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Q16 JEE Main 2023 · 30 Jan · Shift 2 Numerical

The graph of log $\frac{x}{m}$ vs log p for an adsorption process is a straight line inclined at an angle of 45° with intercept equal to 0.6020. The mass of gas adsorbed per unit mass of adsorbent at the pressure of 0.4 atm is _____ $\times 10^{-1}$ (Nearest integer)
Given : log 2 = 0.3010

Numerical value type: the answer is a number.

Answer: 16. · Key from source paper

Q17 JEE Main 2023 · 29 Jan · Shift 1 MCQ

Which of the following salt solutions would coagulate the colloid soloution formed when $\mathrm{FeCl_3}$ is added to NaOH solution, at the fastest rate?

(A) 10 mL of 0.2 mol dm^{-3} $AlCl_3$
(B) 10 mL of 0.1 mol dm^{-3} Na_2SO_4
(C) 10 mL of 0.1 mol dm^{-3} $Ca_3(PO_4)_2$
(D) 10 mL of 0.15 mol dm^{-3} $CaCl_2$

Answer: (A) 10 mL of 0.2 mol dm^{-3} $AlCl_3$ · Key from source paper

Q18 JEE Main 2023 · 29 Jan · Shift 2 MCQ

Match List-I and List-II
List-I
A. Osmosis
B. Reverse osmosis
C. Electro osmosis
D. Electrophoresis
List-II
I. Solvent molecules pass through semi permeable membrane towards solvent side.
II. Movement of charged colloidal particles under the influence of applied electric potential towards oppositely charged electrodes
III. Solvent molecules pass through semi permeable membrane towards solution side
IV. Dispersion medium moves in an electric field.
Choose the correct answer from the options given below:

(A) A-I, B-III, C-IV, D-II
(B) A-III, B-I, C-IV, D-II
(C) A-III, B-I, C-II, D-IV
(D) A-I, B-III, C-II, D-IV

Answer: (B) A-III, B-I, C-IV, D-II · Key from source paper

Q19 JEE Main 2023 · 25 Jan · Shift 1 MCQ

The variation of the rate of an enzyme catalyzed reaction with substrate concentration is correctly represented by graph
(a) *(see the figure above)*
(b) *(see the figure above)*
(c) *(see the figure above)*
(d) *(see the figure above)*

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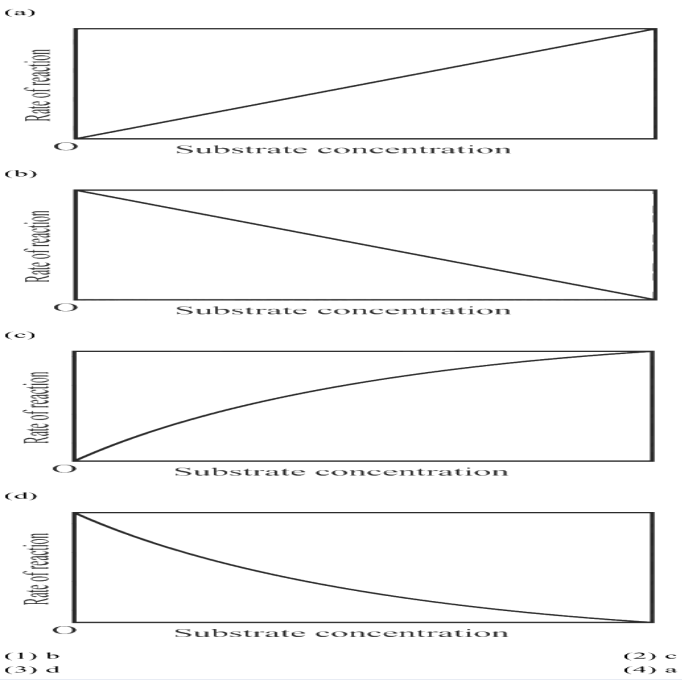
Q58. The variation of the rate of an enzyme catalyzed reaction with substrate concentration is correctly represented by graph



(1) b (2) c
(3) d (4) a

(A) b

(B) c

(C) d

(D) a

Answer: (B) c · Key from source paper

Q20 JEE Main 2023 · 25 Jan · Shift 2 Numerical

The number of incorrect statement/s from the following is/are

A. Water vapours are adsorbed by anhydrous calcium chloride.

B. There is a decrease in surface energy during adsorption.

C. As the adsorption proceeds, ΔH becomes more and more negative.

D. Adsorption is accompanied by decrease in entropy of the system.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q21 JEE Main 2023 · 24 Jan · Shift 2 Numerical

The number of statement/s which are the characteristics of physisorption is _____.

A. It is highly specific in nature

B. Enthalpy of adsorption is high

C. It decreases with increase in temperature

D. It results into unimolecular layer

E. No activation energy is needed

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q22 JEE Main 2022 · 29 Jul · Shift 1 MCQ

100 mL of 5%(w/v) solution of NaCl in water was prepared in 250 mL beaker. Albumin from the egg was poured into NaCl solution and stirred well. This resulted in a/ an

(A) Lyophilic sol
(B) Lyophobic sol
(C) Emulsion
(D) Precipitate

Answer: (A) Lyophilic sol · Key from source paper

Q23 JEE Main 2022 · 29 Jul · Shift 2 MCQ

Given below are the critical temperatures of some of the gases:
Gas / Critical temperature K
He: 5.2
CH_4: 190
CO_2: 304.2
NH_3: 405.5
The gas showing least adsorption on a definite amount of charcoal is

(A) He
(B) CH_4
(C) CO_2
(D) NH_3

Answer: (A) He · Key from source paper

Q24 JEE Main 2022 · 28 Jul · Shift 1 MCQ

Match List-I with List-II.
List-I
A. $4NH_3g + 5O_2g \rightarrow 4NOg + 6H_2Og$
B. $N_2g + 3H_2g \rightarrow 2NH_3g$
C. $C_{12}H_{22}O_{11}aq + H_2Ol \rightarrow C_6H_{12}O_6\text{Glucose} + C_6H_{12}O_6\text{Fructose}$
D. $2SO_2g + O_2g \rightarrow 2SO_3g$
List-II
I. NOg
II. H_2SO_4l
III. Pts
IV. Fes
Choose the correct answer from the options given below

(A) A - II, B - III, C - I, D - IV
(B) A - III, B - II, C - I, D - IV
(C) A - III, B - IV, C - II, D - I
(D) A - III, B - II, C - IV, D - I

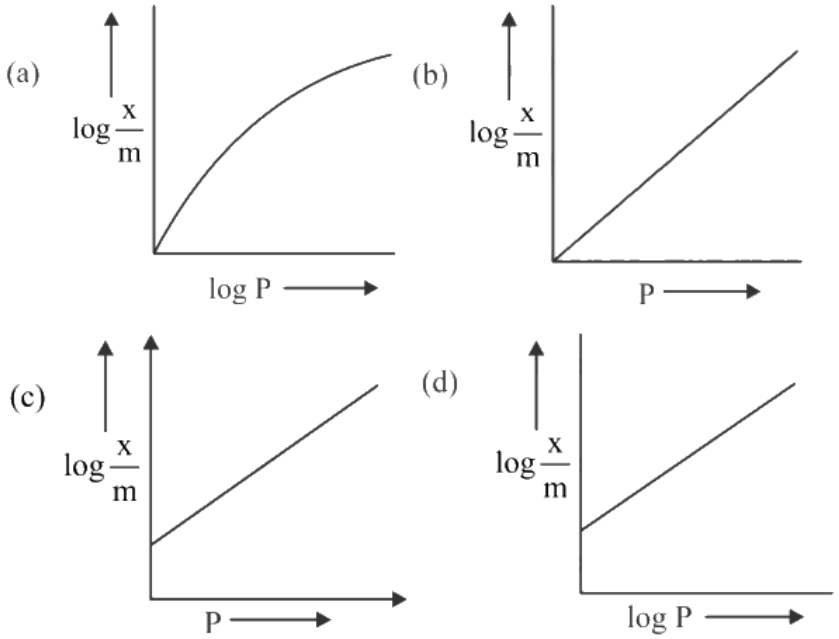
Answer: (C) A - III, B - IV, C - II, D - I · Key from source paper

Q25 JEE Main 2022 · 28 Jul · Shift 2 Numerical

Among the following the number of curves not in accordance with Freundlich adsorption isotherm is

(see the figure above)

Q60. Among the following the number of curves not in accordance with Freundlich adsorption isotherm is



Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q26 JEE Main 2022 · 27 Jul · Shift 1 MCQ

Given below are two statements. One is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : Activated charcoal adsorbs SO_2 more efficiently than CH_4.
Reason R : Gases with lower critical temperatures are readily adsorbed by activated charcoal. In the light of the above statements, choose the correct answer from the options given below.

(A) Both A and R are correct and R is the correct explanation of A.
(B) Both A and R are correct but R is NOT the correct explanation of A.
(C) A is correct but R is not correct.
(D) A is not correct but R is correct.

Answer: (C) A is correct but R is not correct. · Key from source paper

Q27 JEE Main 2022 · 27 Jul · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : Dissolved substances can be removed from a colloidal solution by diffusion through a parchment paper.
Reason R : Particles in a true solution cannot pass through parchment paper but the collodial particles can pass through the parchment paper.
In the light of the above statements, choose the correct answer from the options given below

(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct but R is not the correct explanation of A
(C) A is correct but R is not correct
(D) A is not correct but R is correct

Answer: (C) A is correct but R is not correct · Key from source paper

Q28 JEE Main 2022 · 26 Jul · Shift 1 MCQ

Match List - I with List - II.

	List -I (Processes/Reactions)		List-II (Catalyst)
A	$2\,SO_2(g) + O_2(g) \rightarrow 2\,SO_3(g)$	I	$Fe(s)$
B	$4\,NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$	II	$Pt(s) - Rh(s)$
C	$N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$	III	V_2O_5
D	Vegetable oil (l) + $H_2 \rightarrow$ Vegetable ghee(s)	IV	$Ni(s)$

Choose the correct answer from the options given below

(A) (A) – (III), (B) – (I), (C) – (II), (D) – (IV)
(B) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)
(C) (A) – (IV), (B) – (III), (C) – (I), (D) – (II)
(D) (A) – (IV), (B) – (II), (C) – (III), (D) – (I)

Answer: (B) (A) – (III), (B) – (II), (C) – (I), (D) – (IV) · Key from source paper

Q29 JEE Main 2022 · 26 Jul · Shift 2 MCQ

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : Finest gold is red in colour, as the size of the particles increases, it appears purple then blue and finally gold.
Assertion R : The colour of the colloidal solution depends on the wavelength of light scattered by the dispersed particles.
In the light of the above statements, choose the most appropriate answer from the options given below

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(A) Both A and R are true and R is the correct explanation of A
(B) Both A and R are true but R is NOT the correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

Answer: (A) Both A and R are true and R is the correct explanation of A · Key from source paper

Q30 JEE Main 2022 · 25 Jul · Shift 1 MCQ

Match List - I with List - II

List-II
A $N_2g + 3H_2g \rightarrow 2NH_3g$
B $COg + 3H_2g \rightarrow CH_4g + H_2Og$
C $COg + H_2g \rightarrow HCHOg$
D $COg + 2H_2g \rightarrow CH_3OHg$

List-II
I Cu
II $Cu/ZnO - Cr_2O_3$
III $Fe_xO_y + K_2O + Al_2O_3$
IV Ni

Choose the correct answer from the options given below

(A) A - II, B - IV, C - I, D - III
(B) A - II, B - I, C - IV, D - III
(C) A - III, B - IV, C - I, D - II
(D) A - III, B - I, C - IV, D - II

Answer: (C) A - III, B - IV, C - I, D - II · Key from source paper

Q31 JEE Main 2022 · 25 Jul · Shift 2 MCQ

For micelle formation, which of the following statements are correct?
(A) Micelle formation is an exothermic process.
(B) Micelle formation is an endothermic process.
(C) The entropy change is positive.
(D) The entropy change is negative.

(A) A & D only
(B) A & C only
(C) B & C only
(D) B & D only

Answer: (C) B & C only · Key from source paper

Q32 JEE Main 2022 · 29 Jun · Shift 1 MCQ

Which of the following is a **correct** statement?

(A) Brownian motion destabilises sols.

(B) Any amount of dispersed phase can be added to emulsion without destabilising it.

(C) Mixing two oppositely charged sols in equal amount neutralises charges and stabilises colloids.

(D) Presence of equal and similar charges on colloidal particles provides stability to the colloidal solution.

Answer: (D) Presence of equal and similar charges on colloidal particles provides stability to the colloidal solution. · Key from source paper

Q33 JEE Main 2022 · 28 Jun · Shift 1 MCQ

The Zeta potential is related to which property of colloids?

(A) Colour

(B) Brownian movement

(C) Charge on surface of colloidal particle

(D) Tyndall effect

Answer: (C) Charge on surface of colloidal particle · Key from source paper

Q34 JEE Main 2022 · 28 Jun · Shift 2 MCQ

Match List-I with List-II

List-I

(A) negatively charged sol

(B) macromolecular colloid

(C) positively charged sol

(D) Cheese

List-II

(I) $Fe_2O_3 \cdot xH_2O$

(II) CdS sol

(III) Starch

(IV) a gel

Choose the correct answer from the options given below

(A) (A) – (II), (B) – (III), (C) – (IV), (D) – (I)

(B) (A) – (II), (B) – (I), (C) – (II), (D) – (IV)

(C) (A) – (II), (B) – (III), (C) – (I), (D) – (IV)

(D) (A) – (I), (B) – (III), (C) – (II), (D) – (IV)

Answer: (C) (A) – (II), (B) – (III), (C) – (I), (D) – (IV) · Key from source paper

EdLoop JEE

Q35 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Match List - I with List - II.

List-I

A Lyophilic colloid

B Emulsion

C Positively charged colloid

D Negatively charged colloid

List-II

I Liquid-liquid colloid

II Protective colloid

III $FeCl_3 + NaOH$

IV $FeCl_3$ + hot water

Choose the correct answer from the options given below

(A) (A) – (II), (B) – (I), (C) – (IV), (D) – (III)

(B) (A) – (III), (B) – (I), (C) – (IV), (D) – (II)

(C) (A) – (II), (B) – (I), (C) – (III), (D) – (IV)

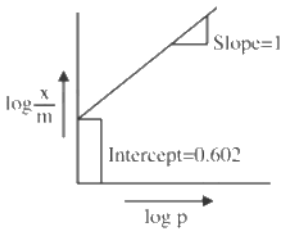
(D) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)

Answer: (A) (A) – (II), (B) – (I), (C) – (IV), (D) – (III) · Key from source paper

Q36 JEE Main 2022 · 27 Jun · Shift 2 Numerical

see figure

Q60.



If the initial pressure of a gas is 0.03 atm, the mass of the gas adsorbed per gram of the adsorbent is____ $\times 10^{-2}$ g

Numerical value type: the answer is a number.

Answer: 12. · Key from source paper

Q37 JEE Main 2022 · 26 Jun · Shift 1 Numerical

2.0 g of H_2 gas is adsorbed on 2.5 g of platinum powder at 300 K and 1 bar pressure. The volume of the gas adsorbed per gram of the adsorbent is mL

(Given : $R = 0.083$ L bar K^{-1} mol^{-1})

Numerical value type: the answer is a number.

Answer: 9960. · Key from source paper

Q38 JEE Main 2022 · 26 Jun · Shift 2 MCQ

Match List I with List II.
List-I Enzyme
A. Invertase
B. Zymase
C. Diastase
D. Maltase
List-II Conversion of
I. Starch into maltose
II. Maltose into glucose
III. Glucose into ethanol
IV. Cane sugar into glucose
Choose the most appropriate answer from the options given below

(A) A - III, B - IV, C - II, D - I
(B) A - III, B - II, C - I, D - IV
(C) A - IV, B - III, C - I, D - II
(D) A - IV, B - II, C - III, D - I

Answer: (C) A - IV, B - III, C - I, D - II · Key from source paper

Q39 JEE Main 2022 · 25 Jun · Shift 1 MCQ

Incorrect statement for Tyndall effect is

(A) The refractive indices of the dispersed phase and the dispersion medium differ greatly in magnitude.
(B) The diameter of the dispersed particles is much smaller than the wavelength of the light used.
(C) It is used to distinguish a true solution from a colloidal solution.
(D) During projection of movies in the cinemas hall, Tyndall effect is noticed.

Answer: (B) The diameter of the dispersed particles is much smaller than the wavelength of the light used. · Key from source paper

Q40 JEE Main 2022 · 25 Jun · Shift 1 MCQ

Using very little soap while washing clothes, does not serve the purpose of cleaning of clothes, because

(A) soap particles remain floating in water as ions.
(B) colloidal structure of soap in water is completely disturbed.
(C) the hydrophobic part of soap is not able to take away grease.
(D) the micelles are not formed due to concentration of soap, below its CMC value.

Answer: (D) the micelles are not formed due to concentration of soap, below its CMC value. · Key from source paper

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Q41 JEE Main 2022 · 24 Jun · Shift 1 MCQ

Given below are two statements:
Statement I : Emulsions of oil in water are unstable and sometimes they separate into two layers on standing.
Statement II : For stabilisation of an emulsion, excess of electrolyte is added.
In the light of the above statements, choose the most appropriate answer from the options given below :

(A) Both Statement I and Statement II are correct.
(B) Both Statement I and Statement II are incorrect.
(C) Statement I is correct but Statement II is incorrect.
(D) Statement I is incorrect but Statement II is correct.

Answer: (C) Statement I is correct but Statement II is incorrect. · Key from source paper

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Q42 JEE Main 2022 · 24 Jun · Shift 2 Numerical

When $200\ \mathrm{mL}$ of $0.2\ \mathrm{M}$ acetic acid is shaken with $0.6\ \mathrm{g}$ of wood charcoal, the final concentration of acetic acid after adsorption is $0.1\ \mathrm{M}$. The mass of acetic acid adsorbed per gram of carbon is g.

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q43 JEE Main 2021 · 1 Sep · Shift 2 MCQ

Match List - I with List - II .
List-I (Colloid Preparation Method)
(a) Hydrolysis
(b) Reduction
(c) Oxidation
(d) Double Decomposition
List-II (Chemical Reaction)
(i) $2\mathrm{AuCl_3} + 3\mathrm{HCHO} + 3\mathrm{H_2O} \rightarrow 2\mathrm{Au(sol)} + 3\mathrm{HCOOH} + 6\mathrm{HCl}$
(ii) $\mathrm{As_2O_3} + 3\mathrm{H_2\ S} \rightarrow \mathrm{As_2\ S_3(sol)} + 3\mathrm{H_2O}$
(iii) $\mathrm{SO_2} + 2\mathrm{H_2\ S} \rightarrow 3\ \mathrm{S(sol)} + 2\mathrm{H_2O}$
(iv) $\mathrm{FeCl_3} + 3\mathrm{H_2O} \rightarrow \mathrm{Fe(OH)_3(sol)} + 3\mathrm{HCl}$
Choose the most appropriate answer from the options given below :

(A) (a) - (i), (b) - (iii), (c) - (ii), (d) - (iv)

(B) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)

(C) (a) - (i), (b) - (ii), (c) - (iv), (d) - (iii)

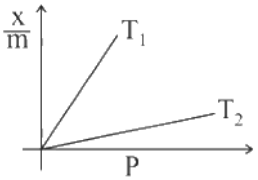
(D) (a) - (iv), (b) - (ii), (c) - (iii), (d) - (i)

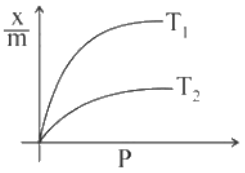
Answer: (B) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii) · Key from source paper

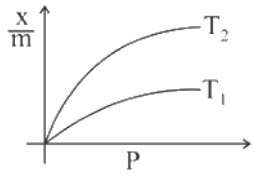
Q44 JEE Main 2021 · 31 Aug · Shift 1 MCQ

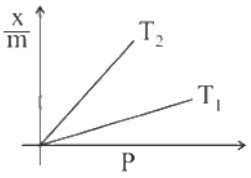
Select the graph that correctly describes the adsorption isotherms at two temperatures T_1 and T_2($T_1 > T_2$) for a gas :
(x - mass of the gas adsorbed m - - mass of adsorbent P - pressure)

Q39. Select the graph that correctly describes the adsorption isotherms at two temperatures T_1 and T_2($T_1 > T_2$) for a gas :
(x – mass of the gas adsorbed m – - mass of adsorbent P–pressure)

(1) 

(2) 

(3) 

(4) 

(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (C) · Key from source paper

Q45 JEE Main 2021 · 31 Aug · Shift 2 Numerical

CH_4 is adsorbed in 1 g charcoal at 0°C following the Freundlich adsorption isotherm. 10.0 mL of CH_4 is adsorbed at 100 mm of Hg, whereas 15.0 mL is adsorbed at 200 mm of Hg. The volume of CH_4 adsorbed at 300 mm of Hg is 10^x mL. The value of x is _____ $\times 10^{-2}$. (Nearest integer)
[Use $\log_{10} 2 = 0.3010$, $\log_{10} 3 = 0.4771$]

Numerical value type: the answer is a number.

Answer: 128. · Key from source paper

Q46 JEE Main 2021 · 27 Aug · Shift 1 MCQ

Tyndall effect is more effectively shown by:

(A) lyophilic colloid
(B) suspension
(C) lyophobic colloid
(D) true solution

Answer: (C) lyophobic colloid · Key from source paper

Q47 JEE Main 2021 · 27 Aug · Shift 2 MCQ

Lyophilic sols are more stable than lyophobic sols because:

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

Answer: (C) the colloidal particles are solvated. · Key from source paper

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Q48 JEE Main 2021 · 26 Aug · Shift 1 MCQ

Which one of the following is correct for the adsorption of a gas at a given temperature on a solid surface?

(A) $\Delta H > 0, \Delta S > 0$
(B) $\Delta H < 0, \Delta S > 0$
(C) $\Delta H > 0, \Delta S < 0$
(D) $\Delta H < 0, \Delta S < 0$

Answer: (D) $\Delta H < 0, \Delta S < 0$ · Key from source paper

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Q49 JEE Main 2021 · 26 Aug · Shift 2 MCQ

The sol given below with negatively charged colloidal particles is:

(A) $AgNO_3$ added to KI solution
(B) KI added to $AgNO_3$ solution
(C) $Al_2O_3 \cdot xH_2O$ in water
(D) $FeCl_3$ added to hot water

Answer: (A) $AgNO_3$ **added to KI solution** · Key from source paper

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Q50 JEE Main 2021 · 27 Jul · Shift 1 Numerical

CO_2 gas adsorbs on charcoal following Freundlich adsorption isotherm. For a given amount of charcoal, the mass of CO_2 adsorbed becomes 64 times when the pressure of CO_2 is doubled. The value of n in the Freundlich isotherm equation is _____ $\times 10^{-2}$. (Round off to the Nearest Integer)

Numerical value type: the answer is a number.

Answer: 17. · Key from source paper

Q51 JEE Main 2021 · 27 Jul · Shift 2 MCQ

Given below are two statement : one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : $SO_2(g)$ is adsorbed to a large extent than $H_2(g)$ on activated charcoal.
Reason R : $SO_2(g)$ has a higher critical temperature than $H_2(g)$
In the light of the above statements, choose the most appropriate answer from the options given below.

(A) Both A and R are correct but R is not the correct explanation fo A
(B) Both A and R are correct and R is the correct explanation of A.
(C) A is not correct but R is correct.
(D) A is correct but R is not correct.

Answer: (B) Both A and R are correct and R is the correct explanation of A. · Key from source paper

Q52 JEE Main 2021 · 25 Jul · Shift 1 MCQ

Sodium stearate $CH_3CH_{2_{16}}COO^-Na^+$ is an anionic surfactant which forms micelles in oil. Choose the correct statement for it from the following :

(A) It forms spherical micelles with $CH_3CH_{2_{16}}$ - group pointing towards the centre of sphere.
(B) It forms non-spherical micelles with $-COO^-$ group pointing outwards on the surface.
(C) It forms spherical micelles with $CH_3CH_{2_{16}}$ - group pointing outwards on the surface of sphere
(D) It forms non-spherical micelles with $CH_3CH_{2_{16}}$ - group pointing towards the centre.

Answer: (C) It forms spherical micelles with $CH_3CH_{2_{16}}$ - group pointing outwards on the surface of sphere · Checked by our team

Q53 JEE Main 2021 · 25 Jul · Shift 2 MCQ

Match List I with List II :
List-I Example of colloids | List-II Classification
(a) Cheese | (i) dispersion of liquid in liquid
(b) Pumice stone | (ii) dispersion of liquid in gas
(c) Hair cream | (iii) dispersion of gas in solid
(d) Cloud | (iv) dispersion of liquid in solid
Choose the most appropriate answer from the options given below

(A) (a) – (iv), (b) – (iii), (c) – (ii), (d) – (i)
(B) (a) – (iv), (b) – (i), (c) – (iii), (d) – (ii)
(C) (a) – (iii), (b) – (iv), (c) – (i), (d) – (ii)
(D) (a) – (iv), (b) – (iii), (c) – (i), (d) – (ii)

Answer: (D) (a) – (iv), (b) – (iii), (c) – (i), (d) – (ii) · Key from source paper

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Q54 JEE Main 2021 · 22 Jul · Shift 1 MCQ

When silver nitrate solution is added to potassium iodide solution then the sol produced is:

(A) $\mathrm{AgI} / \mathrm{I}^-$
(B) $\mathrm{AgI} / \mathrm{Ag}^+$
(C) $\mathrm{KI} / \mathrm{NO}_3^-$
(D) $\mathrm{AgNO_3} / \mathrm{NO}_3^-$

Answer: (A) $\mathrm{AgI} / \mathrm{I}^-$ · Key from source paper

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Q55 JEE Main 2021 · 20 Jul · Shift 1 MCQ

The conditions given below are in the context of observing Tyndall effect in colloidal solutions:
(A) The diameter of the colloidal particles is comparable to the wavelength of light used.
(B) The diameter of the colloidal particles is much smaller than the wavelength of light used.
(C) The diameter of the colloidal particles is much larger than the wavelength of light used.
(D) The refractive indices of the dispersed phase and the dispersion medium are comparable.
(E) The dispersed phase has a very different refractive index from the dispersion medium. Choose the most appropriate conditions from the options given below:

(A) (A) and (E) only
(B) (C) and (D) only
(C) (A) and (D) only
(D) (B) and (E) only

Answer: (A) (A) and (E) only · Key from source paper

Q56 JEE Main 2021 · 20 Jul · Shift 2 Numerical

For coagulation of $50\ \mathrm{mL}$ of a sol, $10\ \mathrm{mL}$ of $0.5\mathrm{M}\ \mathrm{Cl}^-$ ion solution is required. What is the coagulating value of Cl^- ion solution (Nearest integer)
NOTE: NTA question has been changed because it had errors.}

Numerical value type: the answer is a number.

Answer: 100. · Checked by our team

Q57 JEE Main 2021 · 18 Mar · Shift 1 MCQ

Match List–I with List– II

List–I (process)

List– II (catalyst)

(a) Deacon's process (i) ZSM – 5

(b) Contact process (ii) $CuCl_2$

(c) Cracking of hydrocarbons (iii) Ni

(d) Hydrogenation of vegetable oils (iv) V_2O_5

Choose the most appropriate answer from the options given below-

(A) a – ii, b – iv, c – i, d – iii

(B) a – i, b – ii, c – ii, d – iv

(C) a – iii, b – i, c – iv, d – ii

(D) a – iv, b – ii, c – i, d – iii

Answer: (A) a – ii, b – iv, c – i, d – iii · Key from source paper

Q58 JEE Main 2021 · 18 Mar · Shift 2 MCQ

The charges on the colloidal CdS sol and TiO_2 sol are, respectively :

(A) positive and positive

(B) positive and negative

(C) negative and negative

(D) negative and positive

Answer: (D) negative and positive · Key from source paper

Q59 JEE Main 2021 · 17 Mar · Shift 1 MCQ

A colloidal system consisting of a gas dispersed in a solid is called a/an:

(A) solid sol

(B) gel

(C) aerosol

(D) foam

Answer: (A) solid sol · Key from source paper

Q60 JEE Main 2021 · 17 Mar · Shift 2 MCQ

For the coagulation of a negative sol, the species below, that has the highest flocculating power is:

(A) SO_4^{2-}
(B) Ba^{2+}
(C) Na^{+}
(D) PO_4^{3-}

Answer: (B) Ba^{2+} · Key from source paper

Q61 JEE Main 2021 · 16 Mar · Shift 2 MCQ

The INCORRECT statements below regarding colloidal solutions is :

(A) A colloidal solution shows colligative properties.
(B) An ordinary filter paper can stop the flow of colloidal particles.
(C) The flocculation power of Al^{3+} is more than that of Na^{+}
(D) A colloidal solution shows Brownian motion of colloidal particles.

Answer: (B) An ordinary filter paper can stop the flow of colloidal particles. · Key from source paper

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Q62 JEE Main 2021 · 26 Feb · Shift 1 Numerical

$3.12\ g$ of oxygen is adsorbed on $1.2\ g$ of platinum metal. The volume of oxygen adsorbed per gram of the adsorbent at $1\ atm$ and $300\ K$ in L is _____ [R = $0.0821\ L\ atm\ K^{-1}\ mol^{-1}$]

Numerical value type: the answer is a number.

Answer: 2. · Key from source paper

Q63 JEE Main 2021 · 26 Feb · Shift 2 MCQ

The nature of charge on resulting colloidal particles when $FeCl_3$ is added to excess of hot water is:

(A) positive
(B) sometimes positive and sometimes negative
(C) neutral
(D) negative

Answer: (A) positive · Key from source paper

Q64 JEE Main 2021 · 25 Feb · Shift 1 MCQ

In Freundlich adsorption isotherm at moderate pressure, the extent of adsorption $\left(\frac{x}{m}\right)$ is directly proportional to P^x. The value of x is :

(A) zero
(B) $\frac{1}{n}$
(C) 1
(D) ∞

Answer: (B) $\frac{1}{n}$ · Key from source paper

Q65 JEE Main 2021 · 25 Feb · Shift 2 MCQ

Which one of the following statements is FALSE for hydrophilic sols?

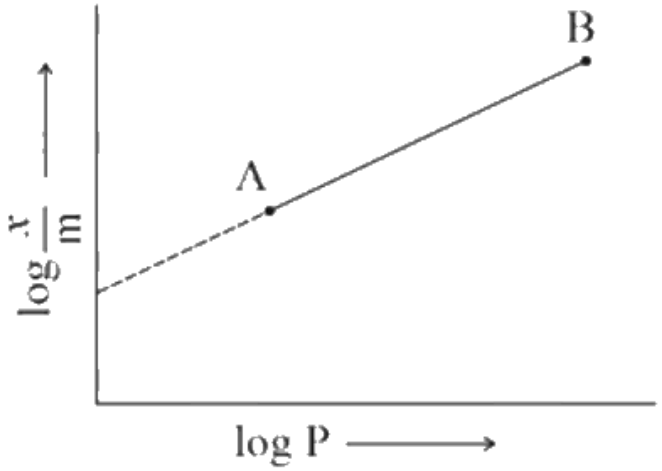
(A) These sols are reversible in nature.
(B) Their viscosity is of the order of that of H_2O.
(C) The sols cannot be easily coagulated.
(D) They do not require electrolytes for stability.

Answer: (B) Their viscosity is of the order of that of H_2O. · Key from source paper

Q66 JEE Main 2021 · 24 Feb · Shift 1 MCQ

In Freundlich adsorption isotherm, slope of AB line is:
(see the figure above)

Q39. In Freundlich adsorption isotherm, slope of AB line is:



(1) $\frac{1}{n}$ with $\frac{1}{n} = 0$ to 1
(2) n with n = 0.1 to 0.5
(3) $\log\frac{1}{n}$ with $n < 1$
(4) logn with $n > 1$

(A) $\frac{1}{n}$ with $\frac{1}{n} = 0$ to 1
(B) n with n = 0.1 to 0.5
(C) $\log\frac{1}{n}$ with n < 1
(D) logn with n > 1

Answer: (A) $\frac{1}{n}$ with $\frac{1}{n} = 0$ to 1 · Key from source paper

Q67 JEE Main 2021 · 24 Feb · Shift 2 MCQ

Most suitable salt which can be used for efficient clotting of blood will be?

(A) $FeCl_3$
(B) $Mg(HCO_3)_2$
(C) $FeSO_4$
(D) $NaHCO_3$

Answer: (A) $FeCl_3$ · Key from source paper

Q68 JEE Main 2020 · 6 Sep · Shift 1 MCQ

Kraft temperature is the temperature:

(A) below which the aqueous solution of detergents starts freezing.
(B) below which the formation of micelles takes place.
(C) above which the aqueous solution of detergents starts boiling.
(D) above which the formation of micelles takes place.

Answer: (D) above which the formation of micelles takes place. · Key from source paper

Q69 JEE Main 2020 · 6 Sep · Shift 2 Numerical

For Freundlich adsorption isotherm, a plot of log (x/m) (y − axis) and log p(x − axis) gives a straight line, the intercept and slope fo rthe line is 0.4771 and 2, respectively. The mass of gas, adsorbed per gram of adsorbent if the initial pressure is 0.04 atm is _____ $\times 10^{-4}$g.

Numerical value type: the answer is a number.

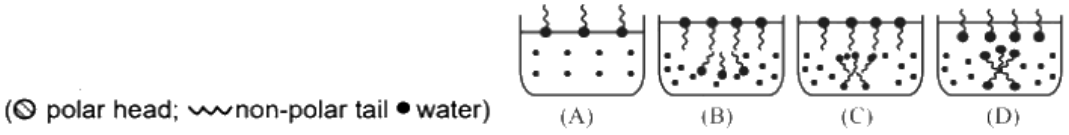
Answer: 48. · Key from source paper

Q70 JEE Main 2020 · 5 Sep · Shift 1 MCQ

Identify the correct molecular picture showing what happens at the critical micellar concentration (CMC) of an aqueous solution of a surfactant

(see the figure above)

Q36. Identify the correct molecular picture showing what happens at the critical micellar concentration (CMC) of an aqueous solution of a surfactant



(1) (D)
(2) (B)
(3) (A)
(4) (C)

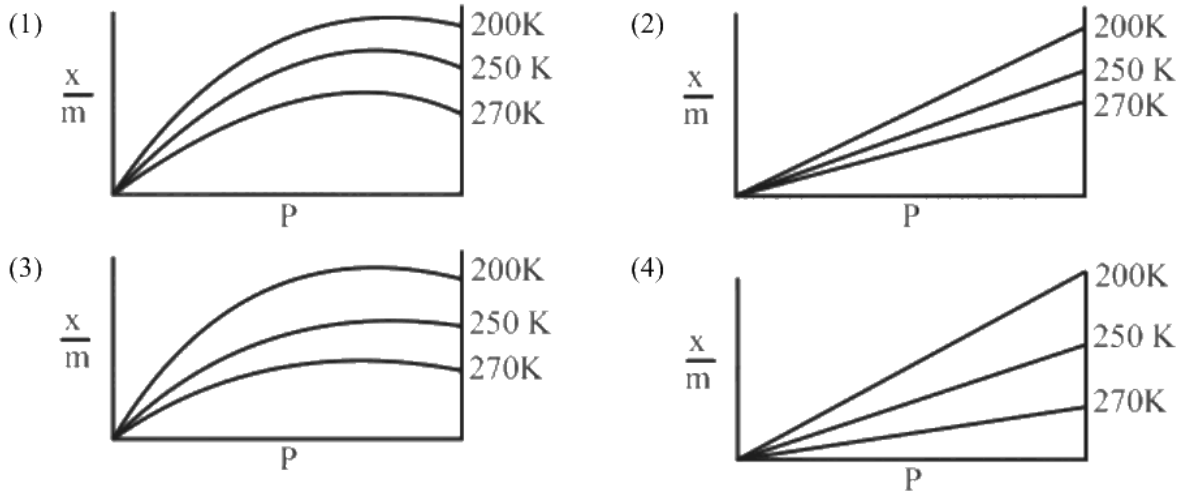
(A) (D)
(B) (B)
(C) (A)
(D) (C)

Answer: (A) (D) · Key from source paper

Q71 JEE Main 2020 · 5 Sep · Shift 2 MCQ

Adsorption of a gas follows Freudlich adsorption isotherm. If x is the mass of the gas adsorbed on mass m of the adsorbent, the correct plot of $\frac{x}{m}$ versus p is:
(see the figure above)

Q39. Adsorption of a gas follows Freudlich adsorption isotherm. If x is the mass of the gas adsorbed on mass m of the adsorbent, the correct plot of $\frac{x}{m}$ versus p is:



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Options (1) or (3) were accepted. More than one answer was accepted. · Key from source paper

Q72 JEE Main 2020 · 4 Sep · Shift 1 MCQ

Match the following:
(i) Foam (a) smoke
(ii) Gel (b) cell fluid
(iii) Aerosol (c) jellies
(iv) Emulsion (d) rubber
(e) froth
(f) milk

(A) (i) – (b), (ii) – (c), (iii) – (e), (iv) – (d)
(B) (i) – (d), (ii) – (b), (iii) – (a), (iv) – (e)
(C) (i) – (e), (ii) – (c), (iii) – (a), (iv) – (f)
(D) (i) – (d), (ii) – (b), (iii) – (e), (iv) – (f)

Answer: (C) (i) – (e), (ii) – (c), (iii) – (a), (iv) – (f) · Key from source paper

Q73 JEE Main 2020 · 4 Sep · Shift 2 MCQ

A sample of red ink (a colloidal suspension) is prepared by mixing eosine dye, egg white, HCHO and water. The component which ensures stability of the ink sample is :

(A) Egg white
(B) Water
(C) HCHO
(D) Eosin dye

Answer: (A) Egg white · Key from source paper

Q74 JEE Main 2020 · 3 Sep · Shift 1 MCQ

Tyndall effect is observed when :

(A) The diameter of dispersed particles is much larger than the wavelength of light used.
(B) The diameter of dispersed particles is much smaller than the wavelength of light used
(C) The refractive index od dispersed phase is greater than that of the dispersion medium.
(D) The diameter of dispersed particles is similar to the wavelength of light used.

Answer: (D) The diameter of dispersed particles is similar to the wavelength of light used. · Key from source paper

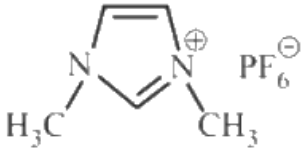
Q75 JEE Main 2020 · 3 Sep · Shift 2 MCQ

An ionic micelle is formed on the addition of:

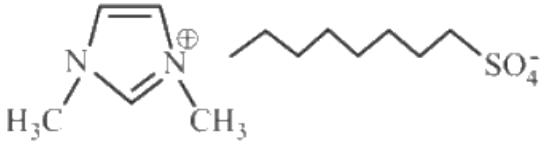
Q44. An ionic micelle is formed on the addition of:

(1) liquid diethyl ether to aqueous $NaCl$ solution

(2) excess water to liquid



(3) excess water to liquid



(4) Sodium stearate to pure toluene

(A) liquid diethyl ether to aqueous $NaCl$ solution
(B) excess water to liquid *(see the figure above)*
(C) excess water to liquid *(see the figure above)*
(D) Sodium stearate to pure toluene

Answer: (C) excess water to liquid *(see the figure above)* · Key from source paper

Q76 JEE Main 2020 · 2 Sep · Shift 1 MCQ

Which of the following is used for the preparation of colloids ?

(A) Ostwald process
(B) Van Arkel Method
(C) Bredig's Arc Method
(D) Mond Process

Answer: (C) Bredig's Arc Method · Key from source paper

Q77 JEE Main 2020 · 2 Sep · Shift 1 Numerical

The mass of gas adsorbed, x, per unit mass of adsorbate, m, was measured at various pressures, p. A graph between $\log \frac{x}{m}$ and $\log p$ gives a straight line with slope equal to 2 and the intercept equal to 0.4771. The value of $\frac{x}{m}$ at a pressure of 4 atm is :
(Given $\log 3 = 0.4771$)

Numerical value type: the answer is a number.

Answer: 48. · Key from source paper

Q78 JEE Main 2020 · 2 Sep · Shift 2 MCQ

Amongst the following statements regarding adsorption, those that are valid are:
(a) ΔH becomes less negative as adsorption proceeds.
(b) On a given adsorbent, ammonia is adsorbed more than nitrogen gas.
(c) On adsorption, the residual force acting along the surface of the adsorbent increases
(d) With increase in temperature, the equilibrium concentration of adsorbate increases.

(A) (d) and (a)
(B) (b) and (c)
(C) (a) and (b)
(D) (c) and (d)

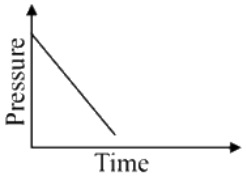
Answer: (C) (a) and (b) · Key from source paper

Q79 JEE Main 2020 · 9 Jan · Shift 2 MCQ

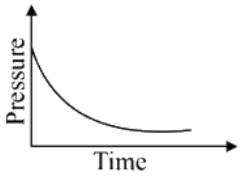
A mixture of gases O_2, H_2 and CO are taken in a closed vessel containing charcoal The graph that represents the correct behaviour of pressure with time is:

Q27. A mixture of gases O_2, H_2 and CO are taken in a closed vessel containing charcoal The graph that represents the correct behaviour of pressure with time is:

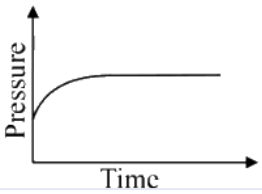
(1)



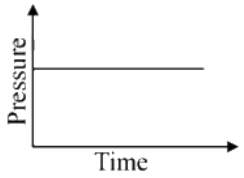
(2)



(3)



(4)



(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Key from source paper

Q80 JEE Main 2020 · 8 Jan · Shift 1 MCQ

As per Hardy-Schulze formulation, the flocculation values of the following for ferric hydroxide sol are in the order:

(A) $K_3[Fe(CN)_6] < K_2CrO_4 < KBr = KNO_3 = AlCl_3$
(B) $K_3[Fe(CN)_6] < K_2CrO_4 < AlCl_3 < KBr < KNO_3$
(C) $AlCl_3 > K_3[Fe(CN)_6] > K_2CrO_4 > KBr = KNO_3$
(D) $K_3[Fe(CN)_6] > AlCl_3 > K_2CrO_4 > KBr > KNO_3$

Answer: (A) $K_3[Fe(CN)_6] < K_2CrO_4 < KBr = KNO_3 = AlCl_3$ · Key from source paper

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Q81 JEE Main 2020 · 8 Jan · Shift 2 MCQ

For the following Assertion and Reason, the correct option is:
Assertion: For hydrogenation reactions, the catalytic activity increases from Group 5 to Group 11 metals with maximum activity shown by Group $7-9$ elements.
Reason: The reactants are most strongly adsorbed on group $7-9$ elements.

(A) The assertion is true, but the reason is false
(B) Both assertion and reason are false
(C) Both assertion and reason are true and the reason is the correct explanation for the assertion
(D) Both assertion and reason are true but the reason is not the correct explanation for the assertion

Answer: (A) The assertion is true, but the reason is false · Key from source paper

Q82 JEE Main 2020 · 7 Jan · Shift 2 · Numerical

The flocculation value of HCl for arsenic sulphide sol is $30\ \mathrm{mmol L^{-1}}$. If $\mathrm{H_2SO_4}$ is used for the flocculation of arsenic sulphide, the amount, in grams, of $\mathrm{H_2SO_4}$ in $250\mathrm{ml}$ required for the above purpose is _____
(molecular mass of $\mathrm{H_2SO_4} = 98\ \mathrm{g/mol}$

Numerical value type: the answer is a number.

Accepted answers: 0.36 or 0.37. · Key from source paper

Q83 JEE Main 2019 · 12 Apr · Shift 1 · MCQ

Peptization is a:

(A) Process of converting a colloidal solution into precipitate
(B) Process of converting soluble particles to form colloidal solution
(C) Process of bringing colloidal molecule into solution
(D) Process of converting precipitate into colloidal solution

Answer: (D) Process of converting precipitate into colloidal solution · Key from source paper

Q84 JEE Main 2019 · 12 Apr · Shift 2 · MCQ

Among the following, the incorrect statement about colloids is:

(A) They are larger than small molecules and have high molar mass.
(B) They can scatter lighht.
(C) The osmotic pressure of a collodial solution is of higher order than the true solution at the same concentration.
(D) The range of diameters of colloidal particles is between 1 and 1000 nm.

Answer: (C) The osmotic pressure of a collodial solution is of higher order than the true solution at the same concentration. · Key from source paper

Q85 JEE Main 2019 · 10 Apr · Shift 1 · MCQ

A gas undergoes physical adsorption on a surface and follows the given Freundlich adsorption isotherm equation
$\frac{x}{m} = kp^{0.5}$
Adsorption of the gas increases with:

(A) Decrease in p and increase in T
(B) Increase in p and decrease in T
(C) Increase in p and increase in T
(D) Decrease in p and decrease in T

Answer: (B) Increase in p and decrease in T · Key from source paper

Q86 JEE Main 2019 · 10 Apr · Shift 2 MCQ

The correct option among the following is.

(A) Brownian motion in colloidal solution is faster if the viscosity of the solution is very high.
(B) Colloidal particles in lyophobic sols can be precipitated by electrophoresis.
(C) Colloidal medicines are more effective because they have small surface area.
(D) Addition of alum to water makes it unfit for drinking.

Answer: (B) Colloidal particles in lyophobic sols can be precipitated by electrophoresis. · Key from source paper

Q87 JEE Main 2019 · 9 Apr · Shift 1 MCQ

The aerosol is a kind of colloid in which

(A) solid is dispersed in gas.
(B) liquid is dispersed in water.
(C) gas is dispersed in solid.
(D) gas is dispersed in liquid.

Answer: (A) solid is dispersed in gas. · Key from source paper

Q88 JEE Main 2019 · 9 Apr · Shift 1 MCQ

Match the catalysts (Column I) with products (Column II)
Column I (Catalyst): A. V_2O_5; B. $TiCl_4/Al(Me)_3$; C. $PdCl_2$; D. Iron Oxide
Column II (Product): P. Polyethylene; Q. Ethanal; R. H_2SO_4; S. NH_3

(A) (A) – (S); (B) – (R); (C) – (Q); (D) – (P)
(B) (A) – (R); (B) – (S); (C) – (P); (D) – (Q)
(C) (A) – (Q); (B) – (R); (C) – (P); (D) – (S)
(D) (A) – (R); (B) – (P); (C) – (Q); (D) – (S)

Answer: (D) (A) – (R); (B) – (P); (C) – (Q); (D) – (S) · Key from source paper

Q89 JEE Main 2019 · 9 Apr · Shift 2 MCQ

10 mL of 1 mM surfactant solution forms a monolayer covering 0.24 cm^2 on a polar substrate. If the polar head is approximated as a cube, what is its edge length?

(A) 1.0 pm
(B) 0.1 nm
(C) 2.0 pm
(D) 2.0 nm

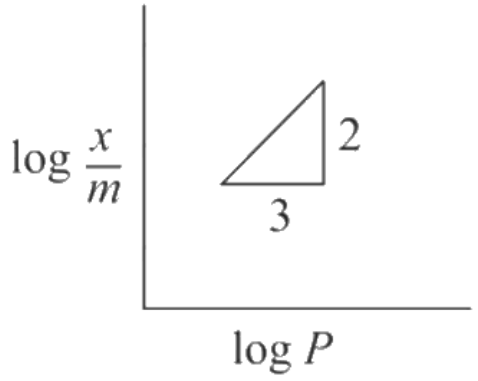
Answer: (C) 2.0 pm · Key from source paper

Q90 JEE Main 2019 · 8 Apr · Shift 1 MCQ

Adsorption of a gas follows Freundlich adsorption isotherm. x is the mass of the gas adsorbed on mass m of the adsorbent. The plot of $\log \frac{x}{m}$ vs $\log p$ is shown in the given graph. $\frac{x}{m}$ is proportional to,

(see the figure above)

Q49. Adsorption of a gas follows Freundlich adsorption isotherm. x is the mass of the gas adsorbed on mass m of the adsorbent. The plot of $\log\frac{x}{m}$ vs logp is shown in the given graph. $\frac{x}{m}$ is proportional to,



(1) p^3 (2) p^2 (3) $p^{2/3}$ (4) $p^{3/2}$

(A) p^3
(B) p^2
(C) $p^{2/3}$
(D) $p^{3/2}$

Answer: (C) $p^{2/3}$ · Key from source paper

Q91 JEE Main 2019 · 12 Jan · Shift 1 MCQ

Given:
Gas: H_2, CH_4, CO_2, SO_2
Critical temperature in K: 33, 190, 304, 630
On the basis of data given above, predict which of the following gases shows the least adsorption on a definite amount of charcoal?

(A) CH_4
(B) CO_2
(C) SO_2
(D) H_2

Answer: (D) H_2 · Key from source paper

Q92 JEE Main 2019 · 12 Jan · Shift 2 MCQ

Among the following, the false statement is:

(A) Latex is a colloidal solution of rubber particles which are positively charged
(B) Tyndall effect can be used to distinguish between a colloidal solution and a true solution.
(C) It is possible to cause artificial rain by throwing electrified sand carrying charge opposite to the one on clouds from an aeroplane.
(D) Lyophilic sols can be coagulated by adding an electrolyte.

Answer: (A) Latex is a colloidal solution of rubber particles which are positively charged · Key from source paper

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Q93 JEE Main 2019 · 11 Jan · Shift 1 MCQ

An example of solid sol is:

(A) Paint
(B) Gem stones
(C) Butter
(D) Hair cream

Answer: (B) Gem stones · Key from source paper

Q94 JEE Main 2019 · 11 Jan · Shift 2 MCQ

Among the colloids cheese (C), milk (M) and smoke (S), the correct combination of the dispersed phase and dispersion medium, respectively is :

(A) C : liquid in solid; M : liquid in solid; S : solid in gas
(B) C : liquid in solid; M : liquid in liquid; S : solid in gas
(C) C : solid in liquid; M : liquid in liquid; S : gas in solid
(D) C : solid in liquid; M : solid in liquid; S : solid in gas

Answer: (B) C : liquid in solid; M : liquid in liquid; S : solid in gas · Key from source paper

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Q95 JEE Main 2019 · 10 Jan · Shift 1 MCQ

Which of the following is not an example of heterogeneous catalysis reaction?

(A) Combustion of Coal
(B) Hydrogenation of Vegetable oils
(C) Ostwald's process
(D) Haber's process

Answer: (A) Combustion of Coal · Key from source paper

Q96 JEE Main 2019 · 10 Jan · Shift 2 MCQ

The haemoglobin and the gold sol are examples of

(A) positively charged sols,
(B) negatively and positively charged sols, respectively.
(C) negatively charged sols.
(D) positively and negatively charged sols, respectively.

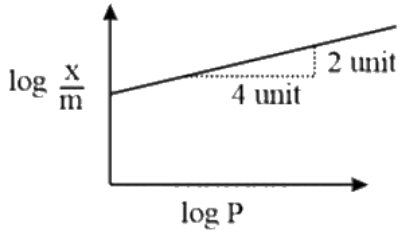
Answer: (D) positively and negatively charged sols, respectively. · Key from source paper

Q97 JEE Main 2019 · 9 Jan · Shift 1 MCQ

Adsorption of a gas follows Freundlich adsorption isotherm. In the given plot, x is the mass of the gas adsorbed on mass m of the adsorbent at pressure P . $\frac{x}{m}$ is proportional to:

(see the figure above)

Q50. Adsorption of a gas follows Freundlich adsorption isotherm. In the given plot, x is the mass of the gas adsorbed on mass m of the adsorbent at pressure P . $\frac{x}{m}$ is proportional to:



(1) $p^{\frac{1}{4}}$ (2) p
(3) p^2 (4) $p^{\frac{1}{2}}$

(A) $p^{\frac{1}{4}}$
(B) p
(C) p^2
(D) $p^{\frac{1}{2}}$

Answer: (D) $p^{\frac{1}{2}}$ · Key from source paper

Q98 JEE Main 2019 · 9 Jan · Shift 2 MCQ

For coagulation of arsenious sulphide sol, which of the following salt solutions will be most effective?

(A) Na_3PO_4
(B) $NaCl$
(C) $AlCl_3$
(D) $BaCl_2$

Answer: (C) $AlCl_3$ · Key from source paper

Q99 JEE Main 2018 · 16 Apr · Online MCQ

Which one of the following is not a property of physical adsorption?

(A) Higher the pressure, more the adsorption
(B) Greater the surface area, more the adsorption
(C) Lower the temperature, more the adsorption
(D) Unilayer adsorption occurs

Answer: (D) Unilayer adsorption occurs · Key from source paper

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Q100 JEE Main 2018 · 15 Apr · Shift 1 MCQ

Which of the following statements about colloids is false?

(A) When silver nitrate solution is added to potassium iodide solution, a negatively charged colloidal solution is formed
(B) Freezing point of colloidal solution is lower than true solution at same concentration of a solute
(C) Colloidal particles can pass through ordinary filter paper
(D) When excess of electrolyte is added to colloidal solution, colloidal particle will be precipitated

Answer: (B) Freezing point of colloidal solution is lower than true solution at same concentration of a solute · Key from source paper

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Q101 JEE Main 2018 · 15 Apr · Shift 2 MCQ

If x gram of gas is adsorbed by m gram of adsorbent at pressure P the plot of $\log \frac{x}{\mathrm{m}}$ versus $\log \mathrm{P}$ is linear. The slope of the plot is: (m and k are constants and $n > 1$)

(A) $\log \mathrm{k}$
(B) $\frac{1}{n}$
(C) $2\mathrm{k}$
(D) n

Answer: (B) $\frac{1}{n}$ · Key from source paper

Q102 JEE Main 2017 · 9 Apr · Online MCQ

Adsorption of gas on a surface follows Freundlich adsorption isotherm. The plot of $\log \frac{x}{m}$ versus $\log(P)$ gives a straight line with slope equal to 0.5, then:
($\frac{x}{m}$ is the mass of the gas adsorbed per gram of adsorbent)

(A) adsorption is proportional to the square root of pressure.
(B) adsorption is proportional to the square of pressure.
(C) adsorption is proportional to the pressure.
(D) adsorption is independent of pressure.

Answer: (A) adsorption is proportional to the square root of pressure. · Key from source paper

Q103 JEE Main 2017 · 8 Apr · Online MCQ

Among the following, the correct statement is:

(A) sols of metal sulphides are lyophilic.
(B) Brownian movement is more pronounced for smaller particles than for bigger-particles.
(C) one would expect charcoal to adsorb chlorine more than hydrogen sulphide.
(D) Hardy Schulze law states that bigger the size of the ions, the greater is its coagulating power.

Answer: (B) Brownian movement is more pronounced for smaller particles than for bigger-particles. · Key from source paper

Q104 JEE Main 2017 · 2 Apr · Offline MCQ

The Tyndall effect is observed only when the following conditions are satisfied,
i The diameter of the dispersed particles is much smaller than the wavelength of the light used.
ii The diameter of the dispersed particle is not much smaller than the wavelength of the light used.
iii The refractive indices of the dispersed phase and dispersion medium are almost similar in magnitude.
iv The refractive indices of the dispersed phase and dispersion medium differ greatly in magnitude.

(A) ii and iv
(B) i and iii
(C) ii and iii
(D) i and iv

Answer: (A) ii and iv · Key from source paper

Q105 JEE Main 2016 · 10 Apr · Online MCQ

Gold numbers of some colloids are Gelatin: $0.005 - 0.01$, Gum Arabic: $0.15 - 0.25$, Oleate: $0.04 - 1.0$, Starch: $15 - 25$. Which among the following is a better protective colloid?

(A) Gelatin
(B) Starch
(C) Oleate
(D) Gum Arabic

Answer: (A) Gelatin · Key from source paper

Q106 JEE Main 2016 · 9 Apr · Online MCQ

A particular adsorption process has the following characteristics: (i) It arises due to van der Waals forces and (ii) it is reversible. Identify the correct statement that describes the above adsorption process:

(A) Adsorption is monolayer
(B) Adsorption increases with increase in temperature
(C) Enthalpy of adsorption is greater than $100\ \text{kJ mol}^{-1}$
(D) Energy of activation is low

Answer: (D) Energy of activation is low · Key from source paper

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Q107 JEE Main 2016 · 9 Apr · Online MCQ

The most appropriate method of making egg-albumin sol is:

(A) Break an egg carefully and transfer the transparent part of the content to 100 mL of 5% w/V saline solution and stir well
(B) Keep the egg in boiling water for 10 minutes. After removing the shell, transfer the yellow part of the content to 100 mL of 5% w/V saline solution and homogenize with a mechanical shaker
(C) Keep the egg in boiling water for 10 minutes. After removing the shell, transfer the white part of the content to 100 mL of 5% w/V saline solution and homogenize with a mechanical shaker
(D) Break an egg carefully and transfer only the yellow part of the content to 100 mL of 5% w/V saline solution and stir well

Answer: (A) Break an egg carefully and transfer the transparent part of the content to 100 mL of 5% w/V saline solution and stir well · Key from source paper

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Q108 JEE Main 2016 · 3 Apr · Offline MCQ

For a linear plot of $\log\left(\frac{x}{m}\right)$ versus $\log$ p in a Freundlich adsorption isotherm, which of the following statements is correct? (k and n are constants)

(A) Only $\frac{1}{n}$ appears as the slope.
(B) $\log\left(\frac{1}{n}\right)$ appears as the intercept.
(C) Both k and $\frac{1}{n}$ appear in the slope term.
(D) $\frac{1}{n}$ appears as the intercept.

Answer: (A) Only $\frac{1}{n}$ appears as the slope. · Key from source paper

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Q109 JEE Main 2015 · 11 Apr · Online MCQ

Under ambient conditions, which among the following surfactants will form micelles in aqueous solution at lowest molar concentration?

(A) $CH_3(CH_2)_{11}\overset{\oplus}{N}(CH_3)_3\,Br^-$
(B) $CH_3-(CH_2)_{13}-OSO_3^-\,Na^+$
(C) $CH_3(CH_2)_{15}\overset{\oplus}{N}(CH_3)_3\,Br^-$
(D) $CH_3-(CH_2)_8-COO^{\ominus}\,Na^+$

Answer: (C) $CH_3(CH_2)_{15}\overset{\oplus}{N}(CH_3)_3\,Br^-$ · Key from source paper

Q110 JEE Main 2015 · 10 Apr · Online MCQ

The following statements relate to the adsorption of gases on a solid surface. Identify the **incorrect** statement among them:

(A) Entropy of adsorption is negative
(B) Enthalpy of adsorption is negative
(C) On adsorption decrease in surface energy appears as heat
(D) On adsorption, the residual forces on the surface are increased

Answer: (D) On adsorption, the residual forces on the surface are increased · Key from source paper

Q111 JEE Main 2015 · 4 Apr · Offline MCQ

$3\ \text{g}$ of activated charcoal was added to $50\ \text{mL}$ of acetic acid solution $(0.06\ \text{N})$ in a flask. After an hour, it was filtered and the strength of the filtrate was found to be $0.042\ \text{N}$. The amount of acetic acid adsorbed (per gram of charcoal) is:

(A) $54\ \text{mg}$
(B) $18\ \text{mg}$
(C) $36\ \text{mg}$
(D) $42\ \text{mg}$

Answer: (B) $18\ \text{mg}$ · Key from source paper

Q112 JEE Main 2015 · 4 Apr · Offline MCQ

Match the catalysts to the correct process.

Catalyst
A. TiCl_3
B. PdCl_2
C. CuCl_2
D. V_2O_5

Process
i. Wacker process
ii. Ziegler – Natta polymerisation
iii. Contact process`
iv. Deacon's process

(A) A $\rightarrow$ iii , B $\rightarrow$ i , C $\rightarrow$ ii , D $\rightarrow$ iv
(B) A $\rightarrow$ iii , B $\rightarrow$ ii , C $\rightarrow$ iv , D $\rightarrow$ i
(C) A $\rightarrow$ ii , B $\rightarrow$ i , C $\rightarrow$ iv , D $\rightarrow$ iii
(D) A $\rightarrow$ ii , B $\rightarrow$ iii , C $\rightarrow$ iv , D $\rightarrow$ i

Answer: (C) A $\rightarrow$ ii , B $\rightarrow$ i , C $\rightarrow$ iv , D $\rightarrow$ iii · Key from source paper

EdLoop JEE

Q113 JEE Main 2013 · 23 Apr · Online MCQ

Smoke is an example of:

(A) Solid dispersed in solid
(B) Gas dispersed in liquid
(C) Solid dispersed in gas
(D) Gas dispersed in solid

Answer: (C) Solid dispersed in gas · Key from source paper

Q114 JEE Main 2013 · 22 Apr · Online MCQ

Flocculation value of $BaCl_2$ is much less than that of KCl for sol A and flocculation value of Na_2SO_4 is much less than that of NaBr for sol B. The correct statement among the following is :

(A) Both the sols A and B are negatively charged.
(B) Sol A is positively charged and Sol B is negatively charged.
(C) Both the sols A and B are positively charged.
(D) Sol A is negatively charged and sol B is positively charged.

Answer: (D) Sol A is negatively charged and sol B is positively charged. · Checked by our team

Q115 JEE Main 2013 · 9 Apr · Online MCQ

The migration of dispersion medium under the influence of an electric potential is called :

(A) Cataphoresis
(B) Electroosmosis
(C) Electrophoresis
(D) Sedimentation

Answer: (B) Electroosmosis · Key from source paper

Q116 JEE Main 2013 · 7 Apr · Offline MCQ

The coagulating power of electrolytes having ions Na^+, Al^{3+} and Ba^{2+} for arsenic sulphide sol increases in the order,

(A) $Ba^{2+} < Na^+ < Al^{3+}$
(B) $Al^{3+} < Na^+ < Ba^{2+}$
(C) $Al^{3+} < Ba^{2+} < Na^+$
(D) $Na^+ < Ba^{2+} < Al^{3+}$

Answer: (D) $Na^+ < Ba^{2+} < Al^{3+}$ · Key from source paper

Q117 AIEEE 2012 · 26 May · Online MCQ

Colloidal solutions can be purified by

(A) emulsification
(B) electrodialysis
(C) peptization
(D) using Tyndall effect

Answer: (B) electrodialysis · Key from source paper

Q118 AIEEE 2012 · 19 May · Online MCQ

On addition of $1\ \mathrm{mL}$ of $10\%\mathrm{NaCl}$ solution to $10\ \mathrm{mL}$ gold sol in the presence of $0.025\ \mathrm{g}$ of starch, the coagulation is just prevented. Starch has gold number

(A) 2.5
(B) 25
(C) 0.25
(D) 0.025

Answer: (B) 25 · Key from source paper

Q119 AIEEE 2012 · 19 May · Online MCQ

Fog is a colloidal solution of

(A) solid particles dispersed in gas
(B) solid particles dispersed in a liquid
(C) liquid particles dispersed in gas
(D) gaseous particles dispersed in a liquid

Answer: (C) liquid particles dispersed in gas · Key from source paper

Q120 AIEEE 2012 · 12 May · Online MCQ

The correct statement for both the processes of physisorption and chemisorption is

(A) both are endothermic
(B) chemisorption is endothermic but physisorption is exothermic
(C) both are exothermic
(D) physisorption is endothermic but chemisorption is exothermic.

Answer: (C) both are exothermic · Key from source paper

Q121 AIEEE 2012 · 7 May · Online MCQ

If x is the mass of the gas adsorbed on mass m of the adsorbent at pressure p, Freundlich adsorption isotherm gives a straight line on plotting

(A) x/m vs p
(B) x/m vs $1/p$
(C) $\log x/m$ vs $\log p$
(D) $\log x/m$ vs p

Answer: (C) $\log x/m$ **vs** $\log p$ · Key from source paper

Q122 AIEEE 2012 · Offline MCQ

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 the above are correct for different ranges of pressure

Answer: (D) All the above are correct for different ranges of pressure · Key from source paper

Q123 AIEEE 2009 MCQ

Which of the following statements is incorrect regarding physissorptions ?

(A) It occurs because of vander Waal's 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 ($\Delta \mathrm{H}_{\text{adsorption}}$) is low and positive.

Answer: (D) Enthalpy of adsorption ($\Delta \mathrm{H}_{\text{adsorption}}$) is low and positive. · Key from source paper

Q124 AIEEE 2008 MCQ

Gold numbers 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 powers is

(A) $D < A < C < B$
(B) C < B < D < A
(C) $A < C < B < D$
(D) B < D < A < C

Answer: (C) $A < C < B < D$ · Key from source paper

Q125 AIEEE 2006 MCQ

In Langmuir's model of adsorption 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 adsorption 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) the mass of gas striking a given area of surface is proportional to the pressure of the gas · Key from source paper

Q126 AIEEE 2005 MCQ

The volume of a colloidal particle, V_C as compared to the volume of a solute particle in a true solution $\mathrm{V_s}$, could be

(A) $\frac{V_C}{V_S} \simeq 1$
(B) $\frac{V_c}{V_s} \simeq 10^{23}$
(C) $\frac{V_c}{V_s} \simeq 10^{-3}$
(D) $\frac{V_c}{V_s} \simeq 10^{3}$

Answer: (D) $\frac{V_c}{V_s} \simeq 10^{3}$ · Key from source paper

Q127 AIEEE 2005 MCQ

The disperse phase in colloidal iron (III) hydroxide and colloidal gold is positively and negatively charged, respectively, which of the following statements is NOT correct?

(A) magnesium chloride solution coagulates, the gold sol more readily than the iron (III) hydroxide sol.
(B) sodium sulphate solution causes coagulation in both sols
(C) mixing the sols has no effect
(D) coagulation in both sols can be brought about by electrophoresis

Answer: (C) mixing the sols has no effect · Key from source paper

Q128 AIEEE 2004 MCQ

Identify the correct statements regarding enzymes

(A) Enzymes are specific biological catalysts that can normally function at very high temperature $(T \sim 1000\ \mathrm{K})$
(B) Enzymes are specific biological catalysts that the posses well - defined active sites
(C) Enzymes are specific biological catalysts that can not be poisoned
(D) Enzymes are normally heterogeneous catalysts that are very specific in their action

Answer: (B) Enzymes are specific biological catalysts that the posses well - defined active sites · Key from source paper

Q129 AIEEE 2003 MCQ

Which one of the following characteristics is not correct for physical adsorption?

(A) Adsorption increases with incresae in temperature
(B) Adsorption is spontaneous
(C) Both enthalpy and entropy of adsorption are negative
(D) Adsorption on solids is reversible

Answer: (A) Adsorption increases with incresae in temperature · Key from source paper

Q130 AIEEE 2002 MCQ

Alum helps in purifying water by

(A) forming Si complex with clay particles
(B) sulphate part which combines with the dirt and removes it
(C) coagulating the mud particles
(D) making mud water soluble

Answer: (C) coagulating the mud particles · Key from source paper

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