Q-1 - 12659904

If x is the amount of adsorbate and m is the amount of absorbent,

which of the following relation is not related to absorption process?

(A) $\frac{x}{m} = pxT$

(B)

$\frac{x}{m}$

$= f(p)$ at constant

T

(C)

$\frac{x}{m}$

$= f(T)$ at constant

p

(D)

$p = f(T)$ at constant

$\frac{x}{m}$

CORRECT ANSWER: B

SOLUTION:

At constant teperature , $T\frac{x}{m} \propto p^{1/n}$

Thus, $\frac{x}{m} = f(p)$at contant$T$.

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Q-2 - 14624631

Which one of the following is an incorrect statement for physisorption ?

(A) it is a reversible process

(B) It requries less heat of adsoption

(C) it requires activation energy

(D) It takes place at low temperature

CORRECT ANSWER: 3

Q-3 - 12659908

According to Langmuir adsorption isotherm, the amount of gas adosobed at very high pressure

(A) Reaches a constant limiting value

(B) Goes on increasing with pressure

(C) Goes on decreasing with pressure

(D) Increase first and decreaseing later with pressure

CORRECT ANSWER: A

SOLUTION:

According to Langmuir adsorption isotherm the amount of gas adsorbed at very high pressure reaches a constant limiting volume.

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Q-4 - 12659914

Langmuir adsorption isotherm is best suitable for

(A) Chemisorptions

(B) physisorption

(C) both (a) and (b)

(D) none of these

CORRECT ANSWER: A

SOLUTION:

Langmuir adsorption isotherm deals with mono-molecular layer possible for chemisorption.

Q-5 - 12659915

Which are not purely surface phenomena?

(A) Absorption, viscosity

(B) adsorption, Absorption

(C) Viscosity , surface tension

(D) adsorption, viscosity

CORRECT ANSWER: A

SOLUTION:

Following are surface phenomena

(i) surface tension (ii) Adsorption

Viscosity and adsorption are not surface phenomena.

Q-6 - 12659919

What will be effect of increases in temperature on physical adsorption?

(A) it will decrease

(B) it will Increase

(C) First increase then decrease

(D) none of these

CORRECT ANSWER: A

SOLUTION:

Since adsorption is an exothermic process (taking place with the evolution of heat) therefore, in accordance with Le-Chatelier's principle, the magnitude of physical adsorption will decrease with the increse in temperture. In case of chemisorption the adsorption first increased and then decreases. with incerease in temperature.

Q-7 - 12659920

Which of the following statements about chemisorption is not applicable?

(A) It involves chemical force between adsorbent and adsorbate

(B) it is irreversible in nature

(C) it involves high heat of adsorption

(D) it does not require activation energy

CORRECT ANSWER: D

SOLUTION:

Activation energy is required for chemical adsorption .

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Q-8 - 12659922

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

(A) Adsorption

(B) absorption

(C) sorption

(D) All of these

CORRECT ANSWER: A

SOLUTION:

Charcoal always do adsorption.

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Q-9 - 12659932

Adsorption is the phenomenon in which a substance :

(A) accumulates on the surface of the other substance

(B) goes into the body of the other substance

(C) remain close to the other substance

(D) none of these

CORRECT ANSWER: A

SOLUTION:

Accumulation substantce on the surface of the other substance is known as adsorption.

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Q-10 - 12659936

For adsorption of gas on solid suface. The plots of $\log x / m$ versus $\log P$ is linear with a slope equal to

(A) K

(B) $\log K$

(C) $\log C$

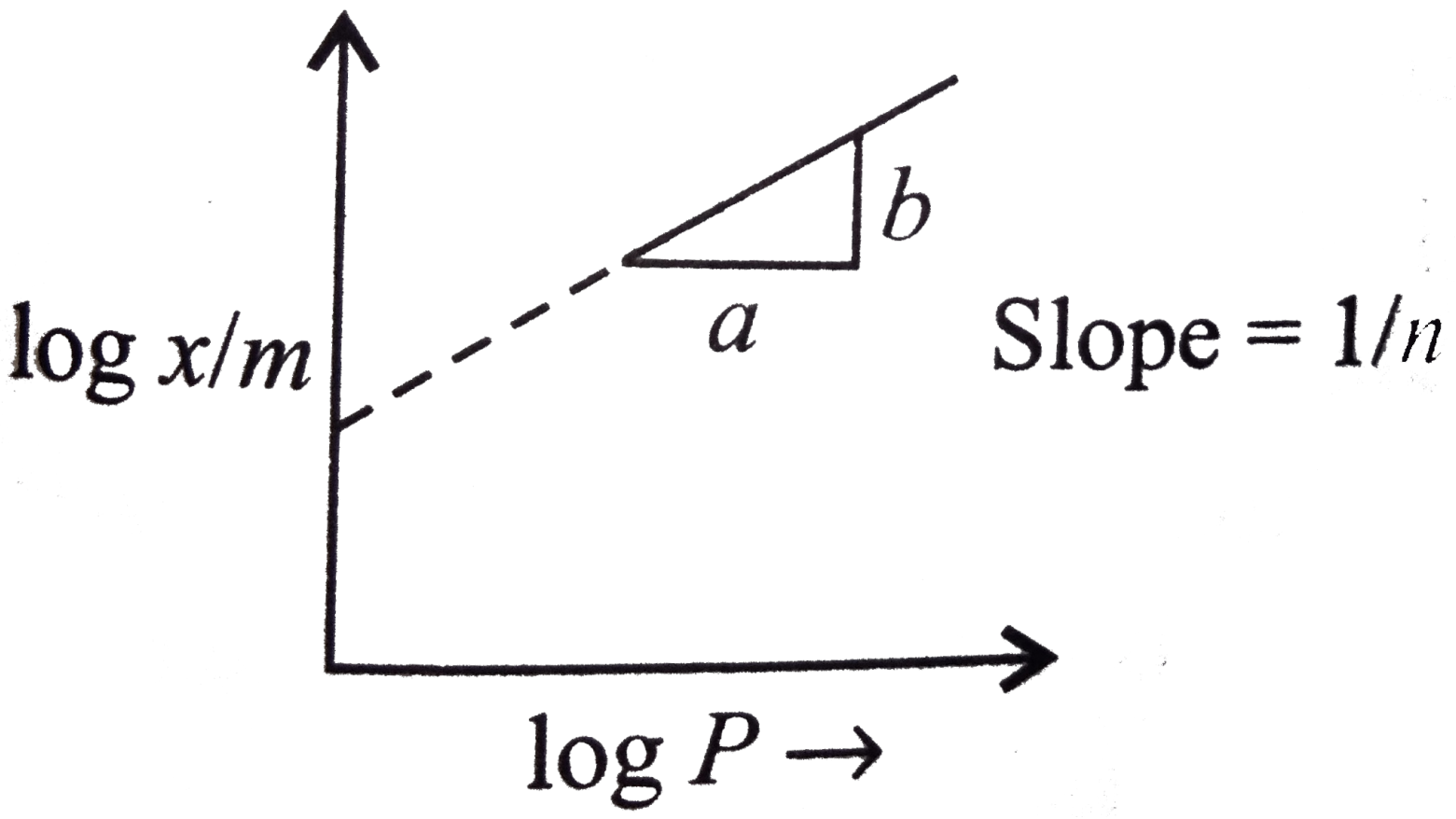
(D) $\frac{1}{n}(n \quad \text{being Integer})$

CORRECT ANSWER: D

SOLUTION:

$$x/m = k.P^{\frac{1}{n}}$$

$$\log x/m = \log k + \frac{1}{n}\log P$$



Slope $= \frac{1}{n}$ where n being intergal.

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Q-11 - 12659940

If H_2 gas is made to adsorb on a surface, then the fraction of surface area of adsorbent convered by gas molecules is proportional to

(A) p

(B) p^0

(C) $p^{1/2}$

(D) p^2

CORRECT ANSWER: C

SOLUTION:

When a diatomic gas adsorbs as atoms on the surface

of a solid, Langmuir adsorption isotherm becomes:

$$\theta = \frac{x}{m}$$

$$= \frac{(kP)^{1/2}}{1 + (kp)^{1/2}}$$

.

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Q-12 - 12659941

Graph between $\log x/m$ and $\log p$ is a straight line inclined at an angle of 45 . When pressure is $0.5atm$ and $1nk = 0.693$, the amount of solute adsorbed per gram of adsorbent will be:

(A) 1

(B) 1.5

(C) 0.25

(D) 2.5

CORRECT ANSWER: A

SOLUTION:

$$\text{Log}\frac{x}{M} = \log k + \frac{1}{n}\log P$$

$$\frac{1}{n} = \tan 45^2 \text{ 1n } k = 0.69$$

$$n = 1k = 2$$

$$\frac{x}{m} = 2 \times (0.5)^1$$

$$x = 1.$$

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Q-13 - 12659943

If the dispersed phase is a liquid and the dispersion medium is a solid , the collide is known as a / an

(A) sol

(B) emulsion

(C) gel

(D) foam

CORRECT ANSWER: C

SOLUTION:

$$\underset{\text{Dispersed phase}}{liquid} + \underset{\text{Dispersed medium}}{solid} = \underset{\text{Colloid}}{Gel\ (e.g\ Butter)}$$

.

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Q-14 - 12659950

Which one of the following is not a colloidal solution?

(A) Smoke

(B) Ink

(C) Air

(D) Bloood

CORRECT ANSWER: C

SOLUTION:

Air is not a colloidal solution because it is a

homogeneous mixture.

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Q-15 - 12659965

the colloidal sols are purified by

(A) Peptisation

(B) Coagulation

(C) Dialysis

(D) Flocculation

CORRECT ANSWER: C

SOLUTION:

Dialysis is a process of removing impurites from colloidal sol.

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Q-16 - 12659970

Lyophilic sols are more stable than lyophobic sols because

(A) the colloidal particles have positive charge

(B) The colloidal particle have negative charge

(C) the colloidal particle are solvated

(D) There are strong electrostatic repulsions between the negatively charged colloidal particles

---

CORRECT ANSWER: C

SOLUTION:

These are highly solvated as the particles have great affinity for solvent.

Q-17 - 12659975

Which of the following is contributed towards the extra stability of lyophilic colloids?

(A) hydration

(B) charge

(C) colour

(D) tyndall effect

CORRECT ANSWER: A

SOLUTION:

Lyophilic means liquid loving hence hydration is contributed towards the extra stability of lyophilic colloids.

Q-18 - 34967491

Which of the following statements is not correct for a lyophobic solution?

(A) It can be easily solvated

(B) It carries charges

(C) The coagulation of this sol is irreversible in nature

(D) It is less stable in a solvent

CORRECT ANSWER: A

Q-19 - 12659985

Liquid-Liquid sol is known as

(A) aerosol

(B) foam

(C) emulsion

(D) gel

CORRECT ANSWER: C

SOLUTION:

Emulsion is liquid in liquid sol.

Q-20 - 12659987

The colloidal system consisting of a liquid adsorbete in a solid adsorbent is termed as:

(A) aerosol

(B) foam

(C) emulsion

(D) gel

CORRECT ANSWER: D

SOLUTION:

Liquid in solid sol is gel.

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Q-21 - 12659988

When dispersed phase is liquid and dispersion medium is gas, then the colloidal system is called

(A) smoke

(B) clouds

(C) emulsion

(D) jellies

CORRECT ANSWER: B

SOLUTION:

$$\begin{array}{l} \text{dispersed phase} \\ \text{liquid} \end{array} + \begin{array}{l} \text{dispersion medium} \\ \text{gas} \end{array} - \begin{array}{l} \text{Colloidal system} \\ \text{clouds} \end{array}$$

.

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Q-22 - 34967504

Size of colloidal particles may range from:

(A) 1 to $1000nm$

(B) 10 to 100 pm

(C) 1 to $100\mu m$

(D) 1 to $10mm$

CORRECT ANSWER: A

SOLUTION:

Colloidal particle has size range of 1 to 1000 nm.

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Q-23 - 12659993

which of the following is a hydrophilic colloidal sol?

(A) Barium sulphate sol.

(B) Arsenious sulphide sol.

(C) Starch sol.

(D) Silver iodide so.

CORRECT ANSWER: C

SOLUTION:

Starch sol. Is example of hydrophilic sol.

Q-24 - 41494743

Which of the following represents a macromolecular colloidal particles ?

(A) Solution of gold

(B) Cellulose

(C) Soaps

(D) Synthetic detergents

CORRECT ANSWER: B

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Q-25 - 12660002

The redispersal of a freshly precipitated substance into a sol by the addition of the addition of an electrolyte in common is known as

(A) Aggregation

(B) Condensation

(C) Coagulation

(D) Peptization

CORRECT ANSWER: D

SOLUTION:

It is definition of peptization.

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Q-26 - 12660005

The minimum concentration of an electrolyte required to cause coagulation or flocculation of a sol is called its flocculation value. It is expressed in

(A) $molL^{-1}$

(B) gL^{-1}

(C) millimoles L^{-1}

(D) equivalentL^{-1}

CORRECT ANSWER: C

SOLUTION:

The minimum concentration of an electrolyte required to cause coagulaton is its flocculation value and is expressed in millimoles L^{-1}.

Q-27 - 12660008

In which of the following Tyndall effect is not observed

(A) Suspensions

(B) emulsion

(C) Sugar solution

(D) Gold sol.

CORRECT ANSWER: C

SOLUTION:

True solution does not show Tyndall effect like sugar solution.

Q-28 - 12660012

The average molecular mass of colloidal can be dertermined by

(A) Tyndall effect

(B) Boling of colloidal

(C) osmotic pressure measurement

(D) Flocculation value

CORRECT ANSWER: C

SOLUTION:

From osmotic pressure measurement , we can determine average molecular mass of colliods .

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Q-29 - 46827844

Ferric hydroxide sol is positively charged colloid. The coagulating power of NO_3^-, SO_4^{2-} and PO_4^{3-} ions would be in the order

(A)

$NO_3^- > SO_4^{2-} > PO_4^{3-}$

(B)

$SO_4^{2-} > NO_3^- > PO_4^{3-}$

(C)

$PO_4^{3-} > SO_4^{2-} > NO_3^-$

(D)

$NO_3^- = SO_4^{2-} = PO_4^{3-}$

CORRECT ANSWER: C

SOLUTION:

According to Hardy schulze rule the ions having opposite charge to sol particle cause coagulation and greater the valency of oppositely charged ion more is the coagulating powerr $\left(PO_4^{3-} > SO_4^{2-} > NO_3^- \right)$

.

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Q-30 - 12660017

Movement of colloidal particles under the influence of electrostatic field is

(A) Electrophoresis

(B) Electrolysis

(C) Dialysis

(D) Ionisation

CORRECT ANSWER: A

SOLUTION:

Movement of chargedcollodal particles under the influence of electrostatic field is called eelctrophoresis due to opposite charge.

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Q-31 - 12660021

Arsenic (III) sulphide forms a sol with a negative charge. Which of the following ionic substances should be most effective in coagulating the sol?

(A) KCl

(B) $MgCl_2$

(C) $Al_2(SO_4)_3$

(D) Na_3PO_4

CORRECT ANSWER: C

SOLUTION:

The more the charge on cation, the more the

effectiveness of the electrolyte.

Q-32 - 12660029

Bleeding is stopped by the application of ferric-chloride this is

because:

(A) ferric chloride seal the blood cells

(B) blood starts flowing in the other direction

(C) Blood is coagulated and blood vessel is sealed

(D) None of these

CORRECT ANSWER: C

SOLUTION:

Fe^{3+} ion coagulates -ve sol particels of blood nd seals the cut.

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Q-33 - 12660018

Which of the following substance gives a positively charged sol?

(A) Gold

(B) A metal sulphite

(C) ferric hydroxide

(D) An acidic dye

CORRECT ANSWER: C

SOLUTION:

$Fe(OH)_3$ gives a positively charged sol as it adsorbe Fe^{3+} ions from $FeCl_3$ solution.

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Q-34 - 12660033

colloidal solution of arsenious sulphide is coagulated by

(A) addition of electrolyte

(B) addition of non-electrolyte

(C) addition of solid As_2S_3

(D) None of these

CORRECT ANSWER: A

SOLUTION:

As_2S_3 is coagulated by addition of electrolyte due to opposite charge.

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Q-35 - 12660071

If some gelatin is mixed in collidal solution of gold, then it does

(A) Coagulation of gold

(B) Peptization of gold

(C) protection of gold sol

(D) protction of gelatin

CORRECT ANSWER: C

SOLUTION:

Some gelatin ix mixed in colloidal solution of gold to from ppt. of gold (peptizatio of gold). Because formation of layer on colloidal particle.

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Q-36 - 12660037

"D elta' at the rivers are formed due to

(A) Peptization

(B) Coagulation

(C) hydrolysis

(D) Precipitation

CORRECT ANSWER: B

SOLUTION:

"D elta" at the rivers are formed due to coagulaton between sea water (+ve charged particles) and river water (-ve charged particles).

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Q-37 - 12660075

A coagulating agent frequently added to water to remove the suspended and colloidal impurities is

(A) Mohr salt

(B) Alum

(C) Bleaching powder

(D) Copper sulphate

CORRECT ANSWER: B

SOLUTION:

Alum is a congulating agent, frequently added to water to remove impurities from water because impurities contain negative charge and alum give positive charge particle for coagulation.

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Q-38 - 12660040

Ferric chloride is applied to stop bleeding cut because

(A) Fe^{3+} ion coagulates blood, which is a negatively charged sol.

(B) Fe^{3+} ion coagulates blood, which is a positively charged sol.

(C) Cl^{-} ion coagulates blood, which is a positively

charged sol.

(D) Cl^- ion coagulates blood, which is a negatively charged sol.

CORRECT ANSWER: A

SOLUTION:

$FeCl_3$ is an electrolyte give Fe^{3+} and blood contain negatively colloid so stop bleeding due to coagulation.

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Q-39 - 12660045

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) Aluminium which coagulates the mud particles

(D) Making mud water soluble

CORRECT ANSWER: C

SOLUTION:

Alum helps in purifying water by Al^{3+} ions which coagulate the negative mud particles.

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Q-40 - 12660046

Maximum coagulation power is in

(A) Na^{+}

(B) Ba^{++}

(C) Al^{+++}

(D) Sn^{++++}

CORRECT ANSWER: D

SOLUTION:

Sn^{4+} contains maximum coagulaton power (coagulation power $\propto$ number of charge on ion).

Flocculation value os expressed in terms of

(a) millimole per litre (b) mole per litre

(c) gram per litre (d) mole per mililitre

(e) Flocculation value is expressed in terms of milimole per litre.

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Q-41 - 46827728

On adding few drops of dilute HCl or $FeCl_3$ to freshly precipitated ferric hydroxide a red coloured colloidal solution is obtained. The

phenomenon is known as:-

(A) Peptization

(B) Dialysis

(C) Protective action

(D) Dissolution

CORRECT ANSWER: A

SOLUTION:

The phenomenon of converting of fresh mass into colloidal state by the action of solute or solvent is known as peptization.

Gold sol is an electronegative sol. The amount of electrolyte required to coagulate a certain amount of gold sol is maximum in this case of

(A) $CaCl_2$

(B) $NaCl$

(C) $AlCl_3$

(D) Na_2SO_4

CORRECT ANSWER: C

SOLUTION:

Coagulation is governed by Hardy schulze rule.

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Q-43 - 12660052

Gold number is maximum for the lyophilic sol is

(A) Gelatin

(B) Haemoglobin

(C) Sodium oleate

(D) Potato starch

CORRECT ANSWER: D

SOLUTION:

Gold number shows the protective power of a lyophilic solution . Lasser the gold number, greater will be the protecting power of that colloid. Gelatin is one of the best protective colloid. Among the given colloids . Potato starch has maximum gold number.

Q-44 - 12660119

Formation of ammonia from H_2 and N_2 by Haber's process using Fe is an example of

(A) Heterogeneous catalysis

(B) Homogenous catalysis

(C) Enzyme catalysis

(D) Non-catalytic process

CORRECT ANSWER: C

SOLUTION:

Many of the d-block (transition) elements and their compounds act as catalyst. Catalytic property is probably due to the utillisation of $(n-1)d$ orbitals of formation of interstital compounds.

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Q-45 - 12660098

the catalyst used in the contact process for manufacturing of sulphuric acid is

(A) Copper

(B) Iron//aluminium oxide

(C) Vanadium pentoxide

(D) Platinized asbestos

CORRECT ANSWER: C

SOLUTION:

$$2\underset{g}{SO_2} + \underset{g}{O_2} \xrightarrow{V_2O_5} 2\underset{g}{SO_3}$$

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Q-46 - 12660100

Which of the following catalyses the conversion of glucose into ethanol?

(A) Zymase

(B) Invertase

(C) Maltase

(D) Diastase

CORRECT ANSWER: A

SOLUTION:

$$C_6H_{12}O_6 \underset{Glucose}{} \xrightarrow[\text{Enzyme}]{\text{Zymase}} 2C_2H_5OH + 2CO_2$$

Q-47 - 12660105

In the reversible reaction a catalyst is the substance which

(A) increases the rate of the forward reaction

(B) Decreases the value of enthalpy change in the reaction

(C) Reduces the time required for reaching the equilibrium state in the reaction.

(D) Decreases the rate of the reverse reaction.

CORRECT ANSWER: C

SOLUTION:

In the reversible reaction a catalyst is the substance which reduces the time required for reaching the equilibrium state in the reaction.

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Q-48 - 12660110

The transition metal used as a catalyst is

(A) Nickel

(B) Platinum

(C) Cobalt

(D) All of these

CORRECT ANSWER: D

SOLUTION:

Ni, Pt and Co all three transition metal are used as a catalysts.

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Q-49 - 12660125

Assertion: A catalyst is more effective in finely divided form.

Reason: Finely divided form has more surface area.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true and the reason is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If assertion is false but reason is true.

CORRECT ANSWER: A

SOLUTION:

A catalyst is more effective in finely divided form because finely divided form has more surface area.

Therefore there is an increase in active centres on the surface3.

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Q-50 - 12660127

Assertion: The Brownian movement is due to the bombardment on colloidal particle by the molecules of dispersion midium which are in the constant motion like molecules in a gas.

Reason: Brownian movement provides a visible proof of the random kinetic motion of molecules in a liquid.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true and the reason is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If assertion is false but reason is true.

CORRECT ANSWER: B

SOLUTION:

on the basis of Brownian movement, we can say that molecules are in continuous motion.

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Q-51 - 12660128

Assertion: In physisorption, adsorption increase with increases in temperature.

Reason: Physisorpation is of exothermic nature.

(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(B) If both assertion and reason are true and the reason

is not the correct explanation of the assertion.

(C) If assertion is true but reason is false.

(D) If assertion is false but reason is true.

CORRECT ANSWER: D

SOLUTION:

Physisorption decreases with increase in temperature.

Q-52 - 11045662

Assertion(A): Langmuir adsorption is a single-layer phenomenon.

Reason(R): It is due to van der Waals forces.

(A) If both (A) and (R) are correct, and (R) is the correct explanation of (A)

(B) If both (A) and (R) are correct, but (R) is the correct explanation of (A).

(C) If (A) is correct, but (R) is incorrect.

(D) If (A) is incorrect, but (R) is correct.

CORRECT ANSWER: C

SOLUTION:

The single layer fromed may be due to van der Waals adsorption or chemisorption.

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Q-53 - 46827505

If x is amount of adsorbate and m is amount of adsorbent, which of the following relations is not related to adsorption process:-

(A) $\frac{x}{m} = p \times T$

(B) $\frac{x}{m} = f(p)$ at constant T

(C) $\frac{x}{m} = f(T)$ at constant P

(D) $p = f(T)$ at constant $\left(\frac{x}{m}\right)$

CORRECT ANSWER: A

SOLUTION:

$x/m = P \times T$ is the incorrect relation

Q-54 - 46827507

If Freundlich Adsorption isotherm, the value of 1/n is:-

(A) Between 0 and 1 in all cases

(B) Between 2 and 4 in all cases

(C) 1 in case of physical adsorption

(D) 1 in case of chemisorption

CORRECT ANSWER: A

SOLUTION:

$$\frac{X}{M} = KP^{\frac{1}{n}} \Rightarrow 0 \leq \frac{1}{n} < 1$$

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Q-55 - 12660172

Catalyst used in hydrogention of oils is

(A) Pt

(B) Mo

(C) Fe

(D) Ni

CORRECT ANSWER: D

SOLUTION:

$$oil + H_2 \xrightarrow{Ni} Ghee$$

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Q-56 - 12660173

Catalyst used in the oxidation of $SO_2 \rightarrow SO_3$

(A) Nickel

(B) $ZnO.\ Cr_2O_3$

(C) V_2O_5

(D) Iron

CORRECT ANSWER: C

SOLUTION:

$$2SO_2 + O_2 \xrightarrow{V_2O_5} 2SO_3.$$

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Q-57 - 12660019

Which of the following is not represented by sols?

(A) adsorption

(B) Tyndall effect

(C) Flocculation

(D) Paramagnetism

CORRECT ANSWER: D

SOLUTION:

Adsorption, Tynadall effect and flocculation are property of sols.

Q-58 - 18255801

Identify the gas which is readily adsorbed by activated charcoal?

(A) H_2

(B) N_2

(C) SO_2

(D) O_2

CORRECT ANSWER: C

SOLUTION:

Easily liquefiable gases like SO_2, NH_3 have greater value of critical temperature than elemental gases, i.e. N_2, O_2, H_2 thus , readily get adsorbed.

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Q-59 - 12659909

Noble gases are adsorbed by

(A) Anhydrous calcium chloride

(B) Farric hydroxide

(C) Cons, H_2SO_4

(D) Activated cocount charcoal

CORRECT ANSWER: D

SOLUTION:

Nobel gases are adsorbed by coconut charcoal . The adsportion of different noble gases occur at different temperature. Hence, charcoal is used to sepratare these gases. Helium is not absorbed by charcoal (as it is a

very difficult liquefiable gas).

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Q-60 - 12660007

Which of the following ielectrolytes is least effective in causing flocculation of ferric hydroxide sol?

(A) $K_4\left[Fe(CN)_6\right]$

(B) K_2CrO_4

(C) KBr

(D) K_2SO_4

CORRECT ANSWER: C

SOLUTION:

KBr is least effective in causing flllocculaton of ferric

hydroxide sol sue to minimum charge at $(KBr)Br$.