

JEE Main Online Exam 2019

Questions & Solutions

8th April 2019 | Shift - I

(Memory Based)

CHEMISTRY

Q.1 Two liquid A & B form ideal solution $p_A^0 = 600$ mmHg; $p_B^0 = 400$ mmHg; $X_B = 0.5$, the mole fraction in vapour phase of A and B is -

- (1) $\frac{1}{3}, \frac{2}{3}$ (2) $\frac{3}{5}, \frac{2}{5}$ (3) $\frac{2}{5}, \frac{3}{5}$ (4) $\frac{1}{2}, \frac{1}{2}$

Ans. [2]

Q.2 $2A + B \longrightarrow P$.

	[A]	[B]	r
exp.(1)	0.05	0.05	0.32
	0.10	0.05	0.64
	0.05	0.10	1.28

Then the rate law can be represented as -

- (1) $r = k[A]$ (2) $r = k[A][B]^2$ (3) $r = k[A][B]$ (4) $r = k[A]^1[B]^0$

Ans. [2]

Q.3 Best oxidising agent is -

- $E_{O_2/H_2O}^0 = +1.23$ V $E_{Au^{+3}/Au}^0 = 1.4$ V
 $E_{S_2O_8^{2-}/SO_4^{2-}}^0 = +2.03$ V $E_{Sn^{+4}/Sn^{+2}}^0 = -1.15$ V

- (1) O_2 (2) Au^{+3} (3) $S_2O_8^{-2}$ (4) Sn^{+4}

Ans. [3]

Q.4 According to I law of thermodynamics which is incorrect -

- (1) Adiabatic process $\Delta U = -w$
 (2) Isochoric process $\Delta U = -q$
 (3) Isothermal process $q = -w$
 (4) Isobaric process $q = \Delta u + w$

Ans. [1]

Q.5 Order of hydration energy for the following ions -

- (1) $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$ (2) $Li^+ > Na^+ > K^+ > Cs^+ > Rb^+$
 (3) $Cs^+ > Rb^+ > K^+ > Na^+ > Li^+$ (4) $Cs^+ > Rb^+ > K^+ > Li^+ > Na^+$

Ans. [1]

Q.6 Order of spin magnetic moment (Low spin compounds)

- (i) $[\text{V}(\text{CN})_6]^{-3}$ (ii) $[\text{Ru}(\text{NH}_3)_6]^{3+}$ (iii) $[\text{Fe}(\text{CN})_6]^{4-}$ (iv) $[\text{Cr}(\text{NH}_3)_6]^{+3}$
 (1) (iv) > (i) > (ii) > (iii) (2) (ii) > (iv) > (iii) > (i)
 (3) (ii) > (i) > (iii) > (iv) (4) (i) > (iii) > (iv) > (ii)

Ans. [1]

Q.7 Reaction of B_2H_6 with O_2 and H_2O , the products are -

- (1) B_2O_3 and $[\text{BH}_4]^-$ (2) B_2O_3 and H_3BO_3 (3) H_3BO_2 and B_2O_3 (4) H_3BO_3 and B_2O_3

Ans. [2]

Q.8 What factor affects size of isoelectronic species Cl^- , Ar , Ca^{2+} ?

- (1) Nuclear charge (2) $\frac{Z}{e}$ ratio (3) Atomic mass (4) Total no. of e^-

Ans. [1]

Q.9 In a solid if B atom occupy CCP arrangement, A are present at all the octahedral moles and O atoms are present at all the tetrahedral void the formula of the compound is -

- (1) ABO_3 (2) $\text{A}_2\text{B}_3\text{O}_4$ (3) ABO_2 (4) $\text{A}_2\text{B}_3\text{O}_5$

Ans. [3]

Q.10 100 ml water sample contain -

0.005 mol $\text{Ca}(\text{HCO}_3)_2$
 0.005 mol $\text{Mg}(\text{HCO}_3)_2$
 Hardness in terms of CaCO_3 ppm.

- (1) 100 ppm (2) 1000 ppm (3) 10,000 ppm (4) 5000 ppm

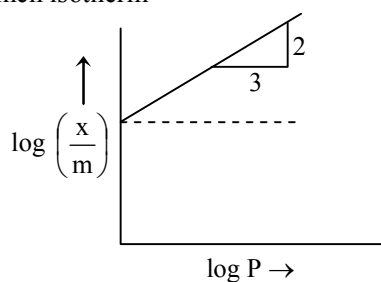
Ans. [3]

Q.11 $\text{Zr}_3(\text{PO}_4)_4$ solubility in terms of K_{sp} ?

- (1) $s = \frac{k_{sp}}{(6912)^{1/7}}$ (2) $s = \left(\frac{k_{sp}}{6912}\right)^{1/7}$ (3) $s = \frac{(k_{sp})^{1/7}}{6912}$ (4) $s = \frac{k_{sp}}{6912}$

Ans. [2]

Q.12 Which one is true about Freundlich isotherm -



- (1) $\frac{x}{m} \propto p^{2/3}$ (2) $\frac{x}{m} \propto p^{1/3}$ (3) $\frac{x}{m} \propto p$ (4) $\frac{x}{m} \propto p^{1/2}$

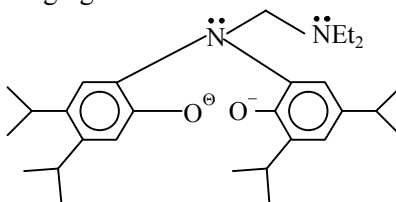
Ans. [1]

Q.13 Ellingham diagram is used for -

- (1) zone refining (2) thermal decomposition
 (3) thermal decomposition (4) vapourphase refining

Ans. [2]

Q.14 What is the denticity of the following ligand



- (1) Monodentate (2) Bidentate (3) Tridentate (4) Tetradentate
Ans. [3]

Q.15 Moles of KMnO_4 are required to oxidize Fe^{+2} into Fe^{+3} and Sn^{+2} into Sn^{+4} respectively -

- (1) 5, 5 moles (2) 5 mol, $\frac{5}{2}$ mol (3) 2 moles, 1 mol (4) $\frac{5}{2}$ mol, $\frac{5}{2}$ mol

Ans. [2]

Q.16 Arrange the following in the increasing order of energy :

- (a) $n = 4$ $\ell = 1$ $m = 1$ $s = +\frac{1}{2}$
 (b) $n = 4$ $\ell = 2$ $m = 0$ $s = -\frac{1}{2}$
 (c) $n = 3$ $\ell = 2$ $m = 1$ $s = +\frac{1}{2}$
 (d) $n = 3$ $\ell = 1$ $m = 0$ $s = -\frac{1}{2}$

- (1) $d < c < a < b$ (2) $d < a < c < b$ (3) $d < a < b < c$ (4) $d < b < a < c$

Ans. [1]

Q.17 Which of the following lanthanides show colour -

- (1) Sm^{+3} (2) Cd^{+3} (3) Lu^{+3} (4) La^{+3}

Ans. [1]

Q.18 Transition in H-atom from $n = 2$ to $n = 1$ releases a photon, which is targetted at He atom having e^- s in $n = 1$ and $n = 2$ states which transition will takes place in He ?

- (1) $n = 1$ to $n = 2$ (2) $n = 2$ to $n = 4$ (3) $n = 1$ to $n = 4$ (4) $n = 2$ to $n = 3$

Ans. [2]

Q.19 Total moles of KMnO_4 required for oxidation of 1 mole each of FeC_2O_4 , $\text{Fe}_2(\text{C}_2\text{O}_4)_3$, and FeSO_4

- (1) 1 (2) 1.5 (3) 2 (4) 3

Ans. [3]