

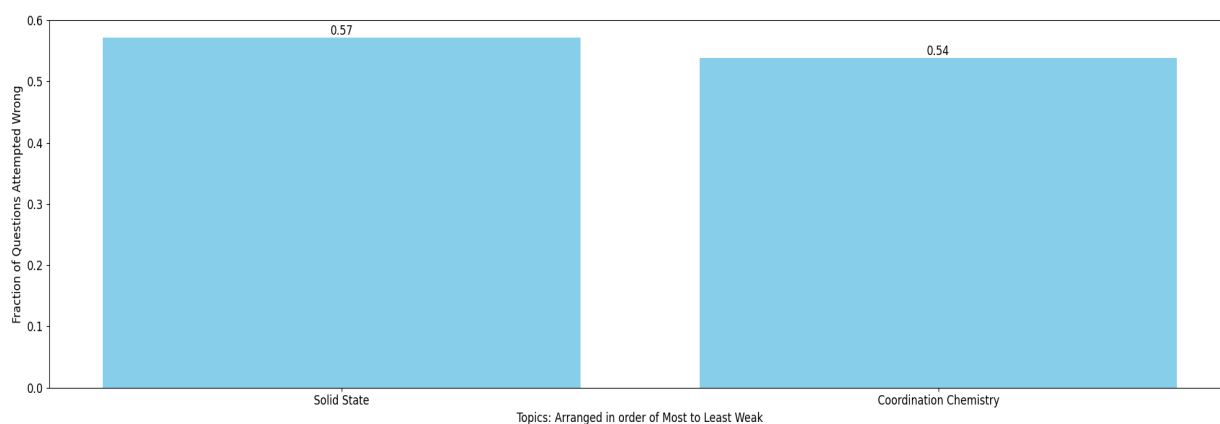
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MLAssist - Personalised DPP

Question Paper Analysis:



Weak Topic Analysis:



Practice Questions:

Solid State:

8. Match items of List-I with those of List-II :

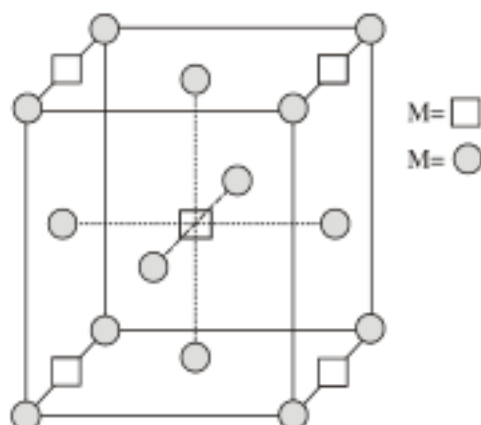
[JEE Main, Aug. 2021]

List-I (Property)	List-II (Example)
(a) Diamagnetism	(i) MnO
(b) Ferrimagnetism	(ii) O ₂
(c) Paramagnetism	(iii) NaCl
(d) Antiferromagnetism	(iv) Fe ₃ O ₄

Choose the most appropriate answer from the options given below:

- (A) (a)-(ii), (b)-(i), (c)-(iii), (d)-(iv)
 (B) (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)
 (C) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)
 (D) (a)-(iv), (b)-(ii), (c)-(i), (d)-(iii)
10. A compound M_pX_q has cubic close packing (ccp) arrangement of X. Its unit cell structure is shown below. The empirical formula of the compound is:

[JEE-2012]



- (A) MX (B) MX₂ (C) M₂X (D) M₅X₁₄

17. What is the number and closest distance between octahedral voids and tetrahedral voids in fcc unit cell?

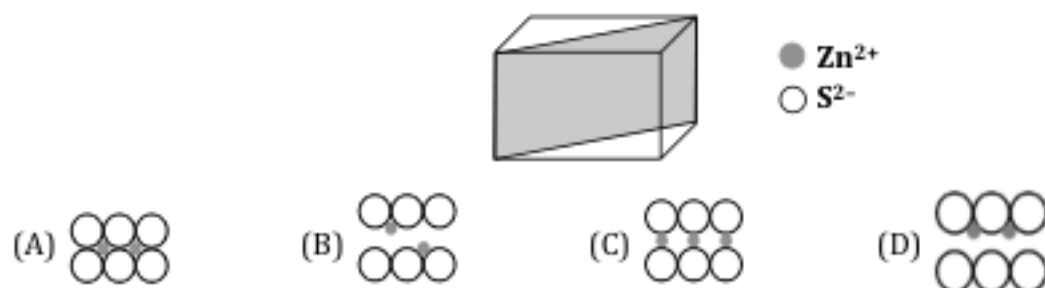
18. Match the crystal system / unit cells mentioned in Column I with their characteristic features mentioned in Column II. Indicate your answer by darkening the appropriate bubbles of the 4×4 matrix given in the ORS. [JEE 2007]

Column I

Column II

- | | |
|---|--|
| (A) simple cubic and face-centred cubic | (P) have these cell parameters $a = b = c$ and $\alpha = \beta = \gamma$ |
| (B) cubic and rhombohedral | (Q) are two crystal systems |
| (C) cubic and tetragonal | (R) have only two crystallographic angles of 90° |
| (D) hexagonal and monoclinic | (S) belong to same crystal system. |

3. In a solid, S^{2-} ions are packed in fcc lattice. Zn^{2+} occupies half of the tetrahedral voids in an alternating arrangement. Now if a plane is cut (as shown) then the cross-section would be:



Coordination Chemistry:

51. Choose the correct statement(s) among the following

[JEE ADV. 2020]

- (1) $[FeCl_4]^-$ has tetrahedral geometry
- (2) $[Co(en))(NH_3)_2Cl_2]^+$ has 2 geometrical isomers
- (3) $[FeCl_4]^-$ has higher spin – only magnetic moment than $[Co(en))(NH_3)_2Cl_2]^+$
- (4) The cobalt ion in $[Co(en))(NH_3)_2Cl_2]^+$ has sp^3d^2 hybridization.

Ans. (1, 3)

5. Number of ambidentate ligands in a representative metal complex $[M(en)(SCN)_4]$ is _____ [en = ethylenediamine] [JEE MAIN 2023]
- Ans. (4)

EXERCISE : JEE-ADVANCED

- The complex ion which has no 'd' electrons in the central metal atom is : [JEE 2001]
[Atomic number Cr = 24, Mn = 25, Fe = 26, Co = 27]
(A) $[MnO_4]^-$ (B) $[Co(NH_3)_6]^{3+}$ (C) $[Fe(CN)_6]^{3-}$ (D) $[Cr(H_2O)_6]^{3+}$
- The correct order of hybridisation of the central atom in the following species. [JEE 2001]
 NH_3 , $[PtCl_4]^{2-}$, PCl_5 and BCl_3 is [At No. Pt = 78]
(A) dsp^2, sp^3d, sp^2 and sp^3 (B) sp^3, dsp^2, sp^3d, sp^2
(C) dsp^2, sp^2, sp^3 and sp^3d (D) dsp^2, sp^3, sp^2 and sp^3d
- The species having tetrahedral shape is : [JEE 2004]
(A) $[PdCl_4]^{2-}$ (B) $[Ni(CN)_4]^{2-}$ (C) $[Pd(CN)_4]^{2-}$ (D) $[NiCl_4]^{2-}$
- The pair of compounds having metals in their highest oxidation state is [JEE 2004]
(A) MnO_2 , $FeCl_3$ (B) $[MnO_4]^-$, CrO_2Cl_2
(C) $[Fe(CN)_6]^{3-}$, $[Co(CN)_6]^{3-}$ (D) $[NiCl_4]^{2-}$, $[CoCl_4]^-$
- Spin only magnetic moment of the compound $Hg^{+2}[Co(SCN)_4]$ is [JEE 2004]
(A) $\sqrt{3}$ (B) $\sqrt{15}$ (C) $\sqrt{24}$ (D) $\sqrt{8}$

33. Match each coordination compound in List-I with an appropriate pair of characteristics from List-II and select the correct answer using the code given below the lists. [JEE Adv. 2014]
{ en = $H_2NCH_2CH_2NH_2$ ' atomic numbers ; Ti = 22 ; Cr = 24 ; Co = 27 ; Pt = 78 }

List-I

- (P) $[Cr(NH_3)_4Cl_2]Cl$
(Q) $[Ti(H_2O)_5Cl](NO_3)_2$
(R) $[Pt(en)(NH_3)Cl]NO_3$
(S) $[Co(NH_3)_4(NO_3)_2]NO_3$

List-II

- (1) Paramagnetic and exhibits ionisation isomerism
(2) Diamagnetic and exhibits cis-trans isomerism
(3) Paramagnetic and exhibits cis-trans isomerism
(4) Diamagnetic and exhibits ionisation isomerism

Code :

	(P)	(Q)	(R)	(S)		(P)	(Q)	(R)	(S)
(A)	4	2	3	1	(B)	3	1	4	2
(C)	2	1	3	4	(D)	1	3	4	2

21. Each of the following obey Sidgwick effective atomic number rule except
(A) $[\text{Cr}(\text{CO})_6]$ (B) $[\text{Co}(\text{NH}_3)_6]^{3+}$
(C) $[\text{Ni}(\text{NH}_3)_6]^{2+}$ (D) $[\text{PtCl}_6]^{2-}$
22. Effective atomic number of $\text{Co}(\text{CO})_4$ is 35, hence it is less stable. It attains stability by
(A) Oxidation of Co (B) Reduction of Co
(C) Dimerization (D) Both (B) & (C)
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