Chemistry BSC-105

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Question bank Ch=> Atomic and Molecular structure

Q1 Differentiate between n-type semiconductor and p type semiconductor ? (2)

Q2 With the help of diagram show crystal field splitting in octahedral complexes. Also Calculate the CFSE for d^5 and d^8 tetrahedral complexes. (4)

Q3 Why do transition elements form coloured compounds ? Explain (4)

Q4 What is crystal field theory ? How does this theory explain the bonding and magnetic behaviour of $Fe[(H_2O)_6]^{2+}$ and $Fe[(CN)_6]^{3-}$ complexes ? (5)

Q5 What is a semiconductor ? Write the difference in the semiconductor obtained by doping Silicon with As or with Ga ? (5)

Q6 List any two reasons for less crystal field splitting in tetrahedral complexes than in octahedral complexes. (2)

Q7 Discuss crystal field energy level diagram for a d^6, weak field, octahedral complex. (4)

Q8 Explain crystal field spleting in octahedral complex $[Fe(CN)_6]^{4-}$. Also Calculate CFSE in d^3 and a d^7 system of tetrahedral complex. (4)

Q9 Define extrinsic and intrinsic semiconductor ? (2)

Q10 On the basis of band structure of solids, differentiate between the Conductor and semiconductors. (5)

Q11 With the help of a suitable example, explain the splitting of d-orbitals, when a transition metal ion is placed in octahedral field of strong and weak field ligands. (4)

Q12 Differentiate between Conductors and semiconductors (2)

Q13 All tetrahedral complexes are high spin complexes. Why ? (2)

Q14 Does temperature influences the conductivity of n type semiconductor ? Discuss (4)

Q15 Describe the role of doping in case of semiconductor w.r.t to electrical conductivity ? (4)

Q16 Discuss the bonding in $[(CO)_5Fe]^{3-}$ and $[Co(NH_3)_6]^{3+}$ in terms of crystal field theory. Also calculate CFSE for d^5 and d^{10} in tetrahedral system. (4)