CLASS XII CHEMISTRY CCT QUESTION

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Read the given passage and answer the questions that follow:

Complex compounds play an important role in our daily life. Werner's theory of complex compounds says every metal atom or ion has primary valency (oxidation state) which is satisfied by negatively charged ions which are ionisable whereas secondary valency (coordination number) is non-ionisable, satisfied by ligands (+ve / –ve/ neutral) but having lone pair. Primary valency is non-directional, secondary valency

is directional. Complex compounds are name according to IUPAC system. Valence bond theory helps in determining shapes of complexes based on hybridization, magnetic properties, outer or inner orbital complex. EDTA is used to treat lead poisoning, cis-platin as anticancer agents. Vitamin B12 is complex of cobalt. Haemoglobin, oxygen carrier is complex of Fe2+ and chlorophyll essential for photosynthesis is complex of Mg2+.

Questions:

1. What is the oxidation state of Ni in $[Ni(CO)_4]$?

a)1 b)0 c)2 d)4

2. One mole of $CrCl_3.6H_2O$ reacts with excess of $AgNO_3$ to yield 2 mole of AgCl. Write formula of complex.

a) $[Cr(H_2O)_5Cl]Cl_2 .H_2O$,

b) $[Cr(H_2O)_4Cl_2]Cl . 2H_2O$

c) $[Cr(H_2O)_3Cl_3]Cl . 3H_2O$

d) $[Cr(H_2O)_6]Cl_3$

(iii) Name the hexadentate ligand used for treatment of lead poisoning.

a) $EDTA^{4-}$

b) Ethylenediamine

c) CN^-

d) H_2O

4. What is hybridization of $[CoF_6]^{3-}$? [Co = 27]

a) sp^3d^2 b) d^2sp^3 c) sp^3d d) dsp^3

Answer key: i) b ii) a iii) a iv) a