

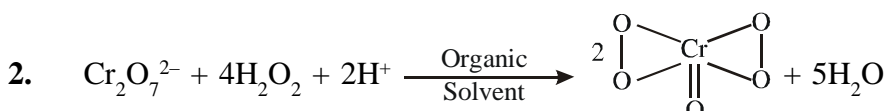
SECTION-I : (i) Only One option correct Type

This section contains **05 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct. **3(-1)**

1. CrCl_3 solution + Na_2S solution \longrightarrow ppt(A)

The correct formula and colour of A are

- (A) Cr_2S_3 , Black (B) $\text{Cr}(\text{OH})_3$, Green
(C) $\text{Na}[\text{Cr}(\text{OH})_4]$, Green (D) None of these



In above reaction amyl alcohol is recommended.

Dimethyl ether is not recommended for general use owing to its -

- (A) Highly non-flammable character (B) Highly inflammable character
(C) Highly poisonous character (D) None of these
3. Solutions of sodium azide(NaN_3) and iodine (as KI_3) do not react but on addition of a trace of X ion, which acts as a catalyst there is an immediate vigorous evolution of nitrogen. Then X may be:
- (A) $\text{S}_2\text{O}_3^{2-}$ (B) S^{2-} (C) SCN^- (D) All are correct.
4. Which of the following can not be removed in the form of slag during the metallurgy of pure metal from haematite
- (A) FeSiO_3 (B) CaSiO_3 (C) MnSiO_3 (D) $\text{Ca}_3(\text{PO}_4)_2$
5. Find the **incorrect** statement regarding complex compound -
- (A) They retain their identity in aq. solution
(B) These compounds are addition compounds.
(C) Generally these compounds show conductivity due to the presence of free central metal ion.
(D) Switzer's salt is a complex compound

(ii) One or more options correct Type

This section contains **05 multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE or MORE** are correct. **4(-1)**

6. Which of the following statement is/are correct -
- (A) By zone refining process ultra pure Si is obtained
(B) Argentiferous rock is consisting of Ag and FeS_2
(C) Liquation can be applied for Cu, Sn Pb
(D) Scum can be formed in poling method in Cu metallurgy
7. Select complex (s) in which all geometrical isomer of complex are optically active
- (A) $[\text{Co}(\text{gly})_3]^0$ (B) $[\text{Co}(\text{en})(\text{NH}_3)(\text{py})(\text{Br})(\text{Cl})]^+$
(C) $[\text{Pt}(\text{NH}_3)(\text{py})(\text{Br})(\text{I})]^0$ (D) $[\text{Pt}(\text{C}_2\text{O}_4)_2(\text{NO}_2)_2]^{2-}$
8. Which of the following compound central atom has sp^3d^2 hybridised :-

- (A) XeOF_5^- (B) XeF_3^- (C) PCl_4^+ (D) ICl_4^-

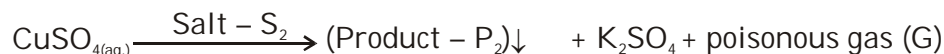
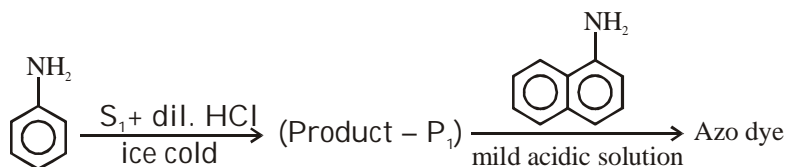
9. Which of the following statements are correct ?
 (A) PCl_3F_2 & 2 butyne both are example of non-planar & non-polar compounds
 (B) In 2D-silicate number of oxygens shared in each tetrahedra unit is 3.
 (C) Drago rule is applicable for PH_3 & PCl_3 both
 (D) The direction of electron (lone pair) movement in CCl_3 & CCl_2 is opposite
10. Select the **INCORRECT** order(s) :-
 (A) $\text{Na}_2\text{O} > \text{MgO} > \text{Al}_2\text{O}_3 > \text{SiO}_2$ (Acidic nature)
 (B) $\text{B} < \text{Al} < \text{Ga} < \text{In} < \text{Tl}$ (Atomic radius)
 (C) $\text{F} > \text{Cl} > \text{Br} > \text{I}$ (Electron affinity)
 (D) $\text{Fe}^{2+} > \text{Fe}^{3+}$ (Magnetic moment)

(iii) Paragraph Type

This section contains **02 paragraphs** each describing theory, experiment, data etc. **Four questions** relate to two paragraphs with two questions on each paragraph. Each question of a paragraph has **only one correct answer** among the four choices (A), (B), (C) and (D).

Paragraph for Q. No. 11 to 12

Consider two potassium salt (S_1) and (S_2) which gives following observation



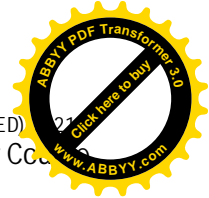
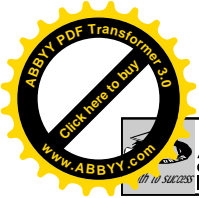
$(\text{Product} - \text{P}_1) + (\text{Product} - \text{P}_2) \longrightarrow$ Show Sandmeyer's reaction

11. Salt- S_2 is
 (A) KCN (B) KBr
 (C) KNO_2 (D) NaCN
12. Select **CORRECT** for anion in salt S_1
 (A) can react with KMnO_4/H^+ (B) react with KI/H^+
 (C) gives NH_3 with $\text{KOH} + \text{Al}$ (D) All are correct

Paragraph for Q. No. 13 to 14

The first simple theory that was put forward to predict the geometry or shape of a covalent molecule is known as VSEPR theory. The theory is primarily based on the fact that in a polyatomic molecule the direction of bond around the central atom depends upon the total number of electron pairs (Bonding as well as non-bonding) in its valence shell.

13. Which of the following statement is **CORRECT** for SO_3 :-
 (A) SO_3 has only $d_\pi-p_\pi$ bond (B) Only $p_\pi-p_\pi$ bonding is present
 (C) Sulphur has +6 oxidation state (D) It is planar and polar
14. Which of the following order of bond angle is **CORRECT** :-



- (A) $\text{H}_2\text{S} < \text{H}_2\text{Te}$ (B) $\text{H}_2\text{O} < \text{OCl}_2$ (C) $\text{ClO}_3^- < \text{BrO}_3^-$ (D) $\text{SiF}_4 > \text{SiCl}_4$

SECTION-II : Matrix-Match Type

This Section contains **02 question**. Question has **four statements** (A, B, C and D) given in **Column I** and four or five statements (P, Q, R, S and T) in **Column II**. Any given statement in Column I can have correct matching with **ONE** or **MORE** statement(s) given in Column II. For example, if for a given question, statement B matches with the statements given in Q and R, then for the particular question, against statement B, darken the bubbles corresponding to Q and R in the ORS.

8(0)

1. Column-(I)

- (A) Cl^- salt solution
(B) Br^- salt solution

(C) I^- salt solution
(D) NO_2^- salt solution

2. Match the column

Column-I (Compound)

- (A) NaH (l)
(B) $\text{TiH}_{1.73}$
(C) CaH_2 (s)
(D) H_2S (g)

Column-(II)

- (P) CHCl_3 - layer test (with chlorine water)
(Q) Yellow solution with excess of chlorine water in layer test
(R) Brown fumes obtained with conc. H_2SO_4
(S) ppt. is formed with conc. AgNO_3

Column-II (Characteristics)

- (P) Covalent hydride
(Q) Ionic hydride
(R) Metallic hydride
(S) Non-conductor of electricity
(T) Conduct electricity

SECTION-IV : Numerical Answer

1. Among the following, find the number of ores in which iron is present in **+2 oxidation state** in its molecular formula?
Siderite, Calamine, Galena, Chalcopyrite, Chromite, Limonite, Rutile, Haematite, Magnetite
2. Total number of hydrogen bond(s) associated with per molecule of H_3BO_3 in layer like structure of H_3BO_3 (s).
3. Find the number of saline (ionic) hydrides given below.
 LiH , $\text{TiH}_{1.8}$, RbH , BeH_2 , CsH , CH_4 , NH_3
4. Total number of electrons present in spherical **shape** orbitals in Cu ($Z = 29$)