

Important Questions - Chemistry

Volume: 13 Unit - 1 Metallurgy

Class: 12

I. One Marks: (BB) (X)

i) Question No: 1, 7, 8, 12, 15, 16, 17, 19, 23, - Book Back.

ii) Book in: (X)

1. Metal that is used for packing food item is Al

II 2 marks: (BB)

i) Book Back:

(q. No.)

- 1) Difference btw mineral & ore. (1)
- 2) Method for refining nickel (5)
- 3) Uses of zinc (8)
- 4) Define gangue, flux, slag (10)
- 5) i) Cryolite in Aluminium extl (12)
ii) Iodine in refining Zn (12)

ii) Book in:

- 6) oxides like Ag_2O & HgO undergoes self reduction? why
- 7) Auto reduction.
- 8) collectors & depressing agent used in froth floating.
- 9) Roasting & smelting.
- 10) vapour phase refining.

III 3 marks or 5 marks:

i) BB

1. Zone refining (q. No: 6)
2. electrometallurgy of alumina (q. No: 9)
3. Electrolytic refining (q: 13)
4. Leaching of gold ore by CN process

- 5) limitations of Ellingham diagram
- 6) electrochemical principle in metallurgy.
- 7) Froth floating with diagram.
- 8) Acid leaching.

Unit - 2 P-block elements I

I) One Marks.

(BB) q. No: 2, 9, 12, 15, 18.

(Bin) 1) Borax is used as flux in metallurgy.

2) All the elements in group 17 & 18 are Non-Metals

3) Sodium salts of tetraboric acids is known as $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$

ii) 2 Marks:

(BB) & (BI)

- 1) anomalous property of 1st element in p-block
- 2) uses of Borax & Boric acid
- 3) Catenation & property of carbon (q: 4)
- 4) Fischer tropsh synthesis (5)
- 5) i) $\text{SiCl}_4 + \text{NH}_3 \rightarrow \text{SiCl}_3\text{NH}_2 + \text{HCl}$
ii) $\text{B} + \text{NaOH} \rightarrow 2\text{Na}_3\text{BO}_3 + 3\text{H}_2$

6) Identify Borate radical - Test

7) Convert boric acid $\rightarrow$ BN

8) why CO is a reducing agent.

9) How is potash alum prepared?

10) uses of potash alum.

11) why graphite is softer than diamond - Justify

12) Explain why ionization enthalpy decreases from Aluminium to Thallium?

iii) 3 Marks & 5 Marks:

1. Give structure of CO & CO_2
2. uses of Silicones
3. structure of diborane
4. Note on zeolites
5. BB. question No: 16, 17.
- 6) Preparation of potash alum.
- 7) Difference b/w all allotropes of carbon
- 8) Define Allotropes of Carbon.

Unit - 3 P-block elements II

I One Marks:

(BB) q. No: 2, 10, 11, 12, 16, 17.

(BI) 1.) shape of XeOF_4 Square Pyramid.

2) compound used in smoke screen is PH_3

3.) coordination isomerism exhibited by $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$

4) $\text{H}_2\text{N}_2\text{O}_2$ is hyponitrous acid.

5) Phosphine is used as smoke screen.

6) Zn is used to prevent rusting of iron & steel.

ii) 2 Marks:

(BB) & (BI)

1. define inert pair effect
2. chalcogen belong to p-block.

3) interhalogen compounds?

4) F₂ is more reactive than halogens - Explain.

5) uses of helium & argon.

6) Rxn of chlorine with cold and hot NaOH.

7) Preparation of chlorine in lab



III 3 marks & 5 Marks:

1) Property of interhalogen compounds (3m)

2) bleaching action of chlorine (5m)

3) Note on Holmes Signal (3m)

8) sulphuric acid as dehydration agent - Justify.

9) Preparation of phosphine from phosphorous acid - ?

10) Bleaching powder prepared.

4) Bleaching action of sulphur dioxide (5m)

5) HF can't be stored in glass bottle - why? (2 marks)

6) structure & molecular formula for sulphurous acid & Marshall's acid. (2 marks)

Unit - 4

Transition Elements.

I one Marks:

(BB) Q: NO: 2, 4, 5, 7, 8, 10, 11, 12, 14, 15, 17, 18, 19.

(BI) 1. Magnetic moment of Cr^{3+} is 3.87 BM

2) Equal weight of $KMnO_4$ in Neutral medium is 52.67

3) transition element which has only +3 oxidate state is Sc

4) Position of Lanthanoids in the periodic table is Group No. 3 & Period No. 6

II 2 Marks:

(BB) 1. what are actinoids & transition metal with eg

2. interstitial compounds

3. cal. the No. of unpaired electrons in Ti^{3+} , Mn^{2+} & cal. the Spin only magnetic moment.

4) which is more stable Fe^{3+} or Fe^{2+}

5) Cr^{2+} is strong reducing agent while Mn^{3+} is strong oxidizing agent.

6) out $Lu(OH)_3$ & $Zr(OH)_3$, which is more basic?

7) which metal in the 3d series exhibit +1 oxidative state frequently?

8) why transition elements shows variable oxidative state?

9) classify d-block & f-block elements.

a) Tungsten

b) promethium

c) Rutherfordium

d) Einsteinium.

10) Olefins & Ziegler-Natta Catalyst (pg No: 111)

3 marks & 5 Marks:

- 1) Preparation of $K_2Cr_2O_7$.
- 2) Preparation of $KMnO_4$
- 3) Position of Lanthanoids
- 4) Lanthanoid contraction, causes & consequences.

- 5) Diff. btw Lanthanoid & Actinoids
- 6) Chromyl chloride test - detail
- 7) Why do d-block elements readily form coordinate compound?
- 8) Cal. Equ weight of $KMnO_4$.
 - a) $MnO_4^- + 2H_2O + 3e^- \rightarrow MnO_2 + 4OH^-$
 - b) $2MnO_4^- + 10Fe^{2+} + 16H^+ \rightarrow 2Mn^{2+} + 10Fe^{3+} + 8H_2O$

Unit - 5

Coordination Compounds.

1 marks:

BB Q.No: 7, 8, 11, 14, 16, 17, 18, 19,

Book-in: ① Zeise's salt is $K_2PtCl_6(C_2H_4)$

② $CH_3-CHO + CO \xrightarrow{\text{Rh complex}} \text{Acetic acid}$

③ In $K_4[Fe(CN)_6]$, the co-ordinate No. of Fe^{2+} is 6

Problem

1. Calculate the magnetic moment and magnetic property of $[CoF_6]^{3-}$?

2 marks:

① Define ionization isomer

② $[Ti(H_2O)_6]^{3+}$ is coloured, while

$[Sc(H_2O)_6]^{3+}$ is colourless - Explain

③ Give one test to differentiate

$[Co(NH_3)_5Cl]SO_4$ & $[Co(NH_3)_5SO_4]Cl$

④ Define linkage isomerism? Eg?

⑤ Define hydrate isomers? Eg?

⑥ What is CFSE?

⑦ Limitations of VB Theory

⑧ Dis. btw double salt & coordination compound (5 point)

3 marks & 5 Marks:

① IUPAC Name of following

a) $Na_2[Ni(EDTA)]$

b) $[Co(en)_3]_2(SO_4)_3$

c) $[Pt(NH_3)_2Cl(NO_2)]$

d) $[Ag(NH_3)_2]^+$ e) $[Co(NH_3)_5Cl]^{2+}$

② Based on VB theory explain why $[Cr(NH_3)_6]^{3+}$ is paramagnetic, while $[Ni(CN)_4]^{2-}$ is diamagnetic.

③ Postulates of Werner's Theory.

4) Nature of bonding in metal carbonyl - Explain.

5) In the complex $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$, mention i) hybridisation
ii) Nature of ligand.
iii) Geometry.

6) Metal complex & metal ions used in Biological system.

7) a) Postulates of Crystal field theory.

b) Crystal field splitting in Octahedral complexes.

8) Explain $[\text{Fe}(\text{CN})_6]^{3-}$ is paramagnetic, using CF Theory.

9) Arrange, ascending order of CFSE Power H_2O , CO , Br^- , CN^- (2m)

Unit - 6 Solid state

I Marks

BB Q. NO: 4, 6, 12, 13, 14, 22.

BT 1. Packing efficiency of BCC is 68%.
2. In Naphthalene, constituent molecules are held together by London force.

II 2 Marks

BB

1) Distinguish b/w isotropy & Anisotropy

2) If No. of closed packed sphere is 6, then No. of octahedral voids & tetrahedral void is _____.

3) Define unit cell & coordination compounds. Number.

4) 3 characters of ionic crystal.

5) Calc. the No. of atoms in fcc, bcc unit cells.

6) Packing efficiency.

7) Diff types of Molecular crystal with examples.

8) Tetrahedral & octahedral void.

9) Define point defect.

III 3 Marks & 5 Marks

1) Crystalline & Amorphous solid

2) Types of unit cell

3) 4 types of defects with example in detail.

4) Explain AAAA, ABAB, & ABCABC - 3d packing.

5) Calculate packing eff of BCC, FCC, SC in detail.

6) FCC solid (atomic mass = 60) has a cube edge of $4\text{\AA}$. Find density.

7) Why ionic crystal is hard & brittle?

8) $\rho = 10\text{gcm}^{-3}$, edge length of cell = 100pm . Find No. of atoms in 1g of crystal.

Unit: 7 Chemical Kinetics

I. marks:

(BB) Q.No: 3, 6, 8, 13, 16, 17, 19, 23, 24.

(BI) 1) If 50% of a 1st order Rxn is completed in 60 min, 75% of same reaction would complete in 120 mins

2) Time required for the reactant concentration to reach half of its initial value is called as half life period.

II. 2 Marks:

(BB) + (BI)

1. What is elementary Rxn.
2. Order & Molecularity
3. Rate determining step with eg.
- 4) Arrhenius equation
- 5) Rate & Rate constant

- 6) What is half-life period.
- 7) Half-life period for 1st & 0th order.
- 8) Schematic representation of proper & improper alignment of reactant for general reaction,
 $A_2 + B_2 \rightarrow 2AB$.
- 9) Effect of catalyst on Rate of Rxn? eg?

III. 3 Marks + 5 Marks:

- 1) Derive integrated Rate Law for 1st order
- 2) Derive integrated Rate Law for 0th order
- 3) Examples for 1st & 0th order.
- 4) Collision theory of bimolecular Rxn.
- 5) Pseudo 1st order Rxn using an example.
- 6) A 1st order Rxn is 40% completed in 50 min. Calculate the value of Rate constant. What is time will Rxn complete at 80%?

- 7) Derive Arrhenius equation
- 8) Show, 1st order Rxn in time required for 99.9% completion is about 10 times its half life period.
- 9) Rate of Rxn $x + 2y \rightarrow \text{product}$ is $4 \times 10^{-3} \text{ mol L}^{-1} \text{ s}^{-1}$, if $[x] = [y] = 0.2 \text{ M}$ and $k = 2 \times 10^{-2} \text{ s}^{-1}$ at 400 K. What is overall order of Reaction.

Ruthy