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CHEMISTRY COACHING CIRCLE

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+2 CHEMISTRY PAPER – 2 FOR BOARD EXAMINATION (Test – 38)

Time Allowed:

3 hours Maximum Marks: 70

General Instructions:

- All questions are compulsory.
- Questions number 1 to 5 are very short answer questions and carry 1 mark each.
- Questions number 6 to 10 are short answer questions and carry 2 marks each.
- Questions number 11 to 22 are also short answer questions and carry 3 marks each.
- Question number 23 is a value based question and carry 4 marks.
- Questions number 24 to 26 are long answer questions and carry 5 marks each.

- A cubic solid is made of 2 elements P & Q are at the corners of the cube & P at the body centre. What is the formulae of the compound? What are the coordination no. of P & Q?
- Give the hybridisation and shape of XeF_4 .
- Zn, Cd, Hg are not regarded as transition elements. Why?
- Write IUPAC name of the following compounds:
(i) $\text{CH}_3 - \underset{\text{O}}{\underset{\parallel}{\text{C}}} - \underset{\text{Br}}{\text{CH}} - \text{CH}_3$ (ii) $\begin{array}{c} \text{COOH} \\ | \\ \text{COOH} \end{array}$
- What do you understand by the term coupling reaction?
- (i) What are anomers?
(ii) Show the graph of the deviation shown by aniline and phenol, give reason.
- (a) Write the unit of molar conductivity.
(b) Why does the conductivity of a solution decrease with dilution?
- (i) What is the covalency of Nitrogen in N_2O_5 ?
(ii) Cl_2 is a bleaching reagent. Justify.
- Give reason for the following:
(i) Zr & Hf exhibit similar properties.
(ii) Transition elements form alloys.
- Describe the steps involved in the preparation of potassium permanganate from manganese dioxide.

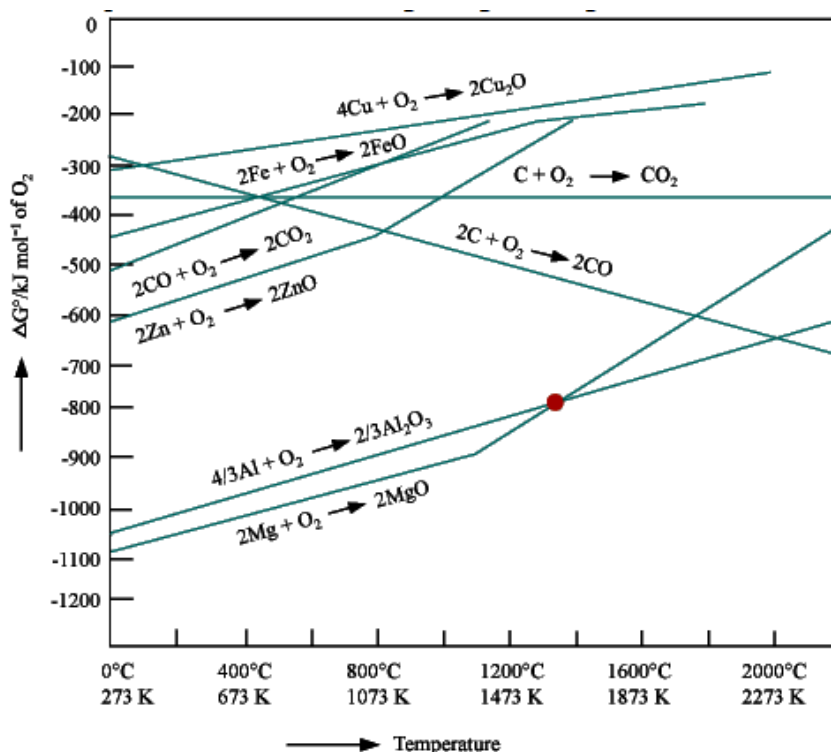
OR

Write the steps involved in the preparation of $\text{K}_2\text{Cr}_2\text{O}_7$ from Chromite ore.

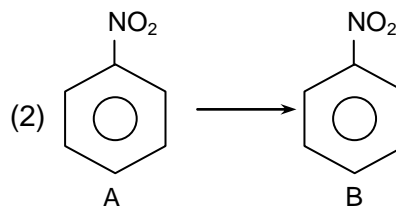
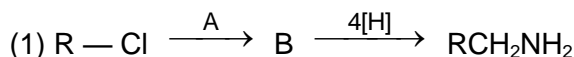
- (a) Gold (atomic radius = 0.144 nm) crystallises in a face centered unit cell. What is the length of a side of the cell?
(b) If NaCl is doped with 20% CdCl_2 . What is the concentration of cation vacancies.
- 45 g of ethylene glycol ($\text{C}_2\text{H}_6\text{O}_2$) is mixed with 600 g water. Calculate:
(a) freezing point depression
(b) freezing point of solution
Given that K_f for water = $1.86 \text{ K kg mol}^{-1}$
- Following data were obtained during the first order thermal decomposition of $\text{N}_2\text{O}_5(\text{g})$ at constant volume:
$$2\text{N}_2\text{O}_5(\text{g}) \longrightarrow 2\text{N}_2\text{O}_4(\text{g}) + \text{O}_2(\text{g})$$

Calculate the rate constant if:
S. No. Time/s Total pressure/atm
1 0 0.5
2 100 0.512
- Explain the following observations:
(a) Physical adsorption in multilayered, while chemisorption is unilayer.
(b) Adsorption is always exothermic process.
(c) Ferric hydroxide sol^n coagulates on addition of potassium sulphate.

15.



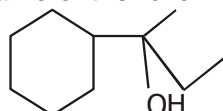
- (a) What is the significance of point A in the above graph?
 (b) Suggest a condition under which magnesium can reduce aluminium.
 (c) Give method for refining nickel.
16. Draw a figure to show splitting of degenerate d-orbitals in an octahedral. How is the magnitude of Δ_0 affected by :
 (i) Nature of ligand.
 (ii) Oxidation State of metal ion.
17. (a) Complete the following reactions :



- (b) Explain with examples:
 (a) Cationic detergent (b) Anionic detergent
18. (1) Write the monomers of BUNA-S & Teflon.
 (2) Differentiate between Nylon-6 and Nylon-66.
 (3) Give an example of each thermoplastic & thermosetting plastic.
19. Answer the following questions briefly :
 (a) What are reducing sugars?
 (b) What are nucleotides?
 (c) Define enzymes.
20. (a) Predict the products of electrolysis of dilute aqueous solution of H_2SO_4 with platinum electrodes.
 (b) How will you calculate λ_0 of $\text{Ba}(\text{OH})_2$ with the help of Kohlrausch's law.
21. Write short notes on :
 (i) Reimer Tiemann reaction
 (ii) Friedel Craft reaction
 (iii) Aldol Condensation.

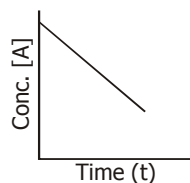
OR

- (i) Write IUPAC name of the following compound :



- (ii) Explain why is ortho-nitrophenol more acidic than orthomethoxyphenol ?
 (iii) Distinguish between propanone and propanol.

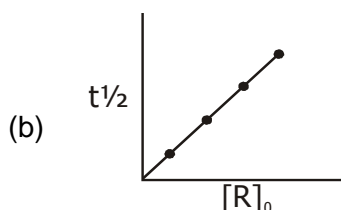
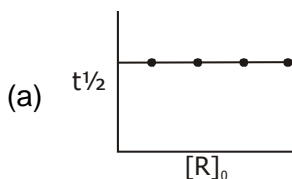
22. (a) Consider the reaction $A \xrightarrow{K} P$. The change in concentration of A with time is shown in the following plot :



- (i) Predict the order of the reaction.
 (ii) Derive the expression for the time required for the completion of the reaction.
 (b) How do you account for the increase in the molar conductivity in case of KCl and CH_3COOH on dilution?
23. (i) Explain the following terms with suitable examples :
 (A) Narrow spectrum antibiotic
 (B) Non ionic detergents.
 (ii) Label the hydrophilic and hydrophobic part in the given compound:
 $\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2\text{SO}_3^- \text{Na}^+$
 (iii) Write the constituents of dettol.
24. Complete the following reactions :
 (a) (i) $\text{PCl}_5 + \text{H}_2\text{O} \longrightarrow$ (ii) $\text{XeF}_2 + \text{PF}_5 \longrightarrow$ (iii) $\text{NaCl} + \text{MnO}_2 + \text{H}_2\text{SO}_4 \longrightarrow$
 (b) H_3PO_4 is tribasic whereas H_3PO_3 is dibasic.
 (c) PCl_5 is solid in ionic state.

OR

- (a) Give the hybridisation of ClF_5 .
 (b) Complete the following reactions :
 (i) $\text{F}_2 + 2\text{X}^- \longrightarrow$
 $\text{X} = ?$
 (ii) $\text{MnO}_2 + 4\text{HCl} \longrightarrow$
 (iii) $\text{XeF}_2 + 2\text{H}_2\text{O} \longrightarrow$
 $\text{PbS} + \text{O}_3 \longrightarrow$
- (c) Give reasons :
 (i) NH_3 is more basic than PH_3 .
 (ii) ICl is more reactive than I_2 .
25. (a) By which test the following pairs of organic compounds can be distinguished: ICl bond is polar.
 (i) CH_3CHO and $\text{C}_6\text{H}_5\text{CHO}$
 (ii) $\text{H}-\text{COOH}$ and CH_3COOH
 (b) Complete the following :
 (i) $\text{CH}_3\text{COCl} \xrightarrow{\text{Pd}-\text{BaSO}_4/\text{S}}$
 (ii) $\text{C}_6\text{H}_5\text{CHO} \xrightarrow{\text{Conc. NaOH}}$
 (iii) $\text{CH}_3\text{CH}_2\text{COOH} \xrightarrow{\text{Cl}_2/\text{Red P}_4}$
26. (a) Write the Nernst equation and the emf of the following cells at 298 K :
 $\text{Sn}/\text{Sn}^{2+} (0.050 \text{ M}) \parallel \text{H}^+ (0.020 \text{ M}) \mid \text{H}_2(\text{g}) \mid \text{Pt}(\text{s})$
 1 bar
- (b) (i) Give the order of the reaction :



- (ii) Write Arrhenius equation showing the effect of temperature on rate of reaction.