CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

SELF ASSESSMENT PAPER 7

Questions

1. Fill in the blanks by choosing the appropriate word/words from those given in the brackets : (aromatic oxide, aromatic hydride, bleaching, oxidizing, higher, molecule, lower, cation, a reducing, anode, cathode, alkyl halide)

(i) Aromatic ether is prepared by heating . . . . . with . . . . . .

(ii) $CaOCl_2$ acts as . . . . . agent because of its . . . . . properties.

(iii) In a galvanic cell, electrons flow from . . . . . to . . . . . through the connecting wires.

(iv) Write : . . . . . ratio is the ratio of the radius of cation to that of . . . . . selecting the correct alternative from the choice given : (atom/radius/anion)

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2. Match the following :

(i) Carbylamine - Surcose

(ii) Disaccharide - Complex

(iii) Cannot be prepared easily from precipitate - Obnoxious smell

(iv) Sequence of elementary reactions - Irreversible colloid

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Questions Complete The Following Statements By Selecting The Correct Alternative From The Choice Given

1. Phenol is less acidic than

A. Wthanol

B. o-nitrophenol

C. o-methylphenol

D. o-methoxyphenol

Answer:

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2. Nucleophide substitution reaction is slowest with :

A. Iodolkanes

B. Fluoroalkanes

C. Chlorolkanes

D. Bromoalkanes

Answer:

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3. Which of the following furnaces can used to get above $3000^{\circ}C$ temperature ?

1) Blast furnace

2) Arc furnace

3) Muffle furnace

4) Reverberatory furnace

A. Blast furnace

B. Arc furnace

C. Muffle furnace

D. Reverberatory furnace

Answer:

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4. The value of van't Hoff factor (i) =2 is for

A. Glucose

B. Sucrose

C. Calcium chloride

D. Sodium chloride

Answer:

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Questions Answer The Following Questions

1. Write a reaction to show preparation of acetamide form a weak acid and weak base ? Also give equations to justify it is amphoteric in nature.

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2. Give the IUPAC names for the following :

(i) $Na_3[AIF_6]$

(ii) $\left[Co(NH_3)_6\right]Cl_3$

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3. What are interstitial compounds? Why are such compounds well known for transition metals?

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4. A solution is obtained by mixing 300g of 25% solution ad 400 g of 40% solution by mass. Calculate the mass percentage of the resulting solution.

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5. For a first order reaction, show that time required for 99% completion is twice the time required for the completion of 90% of reaction.

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6. What are limited spectrum are antibiotics ? Give one example.

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7. What is meant by the term 'broad spectrum antibiotics' ? Explain.

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8. During nuclear explosion, one of the products is ^{90}Sr with half-life of 28.1 years. If 1μg of ^{90}Sr was absorbed in the bones of a newly born baby instead of calcium, how much of it will remain after 10 years and 60 years if it is not lost metabolically.

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9. Explain the following with at least one example : Carbylamine reaction.

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10. (i) Which alkyl hailde from the following pair is chiral and undergoes faster S_N2 reaction ?

(ii) Out of S_N1 and S_N2 which reaction occurs with

(a) Inversion of configuration

(b) Recemisation

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11. Give one example of a fibrous protein. Name the final product of hydrolysis of proteins. What is denaturation of proteins ?

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12. Give any chemical test to distinguish between the following pair of compounds : acetine and phenol.

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13. Give chemical test to distinguish : ethyl alcohol and sec - propyl alcohol.

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14. In a reaction between A and B, the initial rate of reaction was measured for different initial concentrations of A and B as given below:

A/M	0.20	0.20	0.40
B/M	0.30	0.10	0.05
r_0/Ms^{-1}	5.07×10^{-5}	5.07×10^{-5}	7.6×10^{-5}

What is the order of reaction with respect to A and B ?

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15. A sample of drinking water was found to e severely contaminated with chloroform $(CHCl_3)$ supposed to e a carcinogen. The level of contamination was 15 ppm (by mass).

(i). Express this in percent by mass

(ii). Determine the molality of chloroform in the water sample.

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16. Niobium crystallizes in body centred cubic structure. If its density is 8.55 g cm^{-3}, calculate the atomic radius of niobium. (Atomic mass of Nb = 93u , $N_A = 6.02 \times 10^{23} mol^{-1}$)

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17. How are the following colloidal solutions prepared ?

(a) Sulphar in water

(b) Gold in water

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18. What are emulsions ? What are their different types ? Give an example of each type.

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19. The air is a mixture of a number of gases. The maojr components are oxygen and nitrogen with approximate proportion of $20\,\%$ is to $79\,\%$ by volume at 298 K. The water is in equilibrium with air at a pressure of 10 atm. At 298 K if the Henry's law constants for oxygen and nitrogen at 298 K are 3.30×10^7 mm and 6.51×10^7 mm respectively, calculate the composition of these gases in water.

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20. Write the formuae of the following coordination compounds :

(i) Potassium tetracyanonickelate(0)

(ii) Triammine trinitrocobalt (III)

(iii) Tetraammine dichloroplatinum (IV) tetrachloroplatinate (II)

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21. How would you account for the irregular variation of ionization enthalpies (first and second) in the first series of the transition elements ?

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22. How can the following conversion be brought about : Nitrobenzene to 2,4,6-tribromoaniline.

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23. Give one reason for the following : Direct nitration of aniline is not possible.

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24. How would you account for the following :

(i) Out of the d^4 species, Cr^{2+} is strongly reducing while manganese (III) is strongly oxidising.

(ii) Cobalt (II) is stable in aqueous solution but in the presence of complexing reagents it is easily oxidized.

(iii) The d^1 configuration is very unstable in ions.

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25. Giving examples differentiate between calcination and roasting.

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26. Three electrolytic celss A,B,C containing solutions of $ZnSO_4$, $AgNO_3$ and $CuSO_4$, respectively are connected in series. A steady current of 1.5 amperes was passes through them until 1.45 g of silver deposited at the

cathode of cell B. How long did the current flow ? What mass of copper and zinc were deposited.

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27. A solution of $Ni(NO_3)_2$ is electrolysed between platinum electrodes using a current of 5 amperes for 20 minutes what mass of Ni is deposited at the cathode?

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28. Draw the structures of white phosphorus and red phosphorus. Which one of these two types of phosphorus is more reactive and why?

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29. Write the conditions to maximise the yield of H_2SO_4 by Contact proces.

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30. Considering the parameters such as bond dissociation enthalpy, electron gain enthalpy and hydration enthalpy, compare the oxidising power of F_2 and Cl_2

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31. The HNH angle value is higher than HPH, HAsH and HSbH angles. Why? [Hint: Can be explained on the basis of sp_3 hybridisation in NH_3 and only s–p bonding between hydrogen and other elements of the group].

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32. Identify A to F :

$$A \xrightarrow{LiAlH_4} C_2H_5OH \xrightarrow{PBr_3} B \xrightarrow{KCN} C \xrightarrow{D} C_3H_7NH_2 \xrightarrow{HNO_2} E \xrightarrow[K_2Cr_2O_7/H^+]{[O]}$$

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33. Write balanced chemical equations for the following and name the reactions occurring in each case :

(A) Benzaldehyde react with an alcoholic solution of potassium cyanide.

(B) Propanone is treated with iodine and excess of alkali and warmed.

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34. Give one test to distinguish between the following pair. Write the relevant equation. Acetophenone and benzophenone.

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