CHEMISTRY

BOOKS - U-LIKE CHEMISTRY (HINGLISH)

CBSE EXAMINATION PAPER 2020 (CODE No.56/4/1)

Section A

1. Read the given passage and answer the questions number 1 to 5 that follow :

Colloidal particles always carry an electric charge which may be either positive or negative. For example, when $AgNO_3$ solution is added to Kl solution, a negatively charged colloidal sol is obtained. The presence of equal and similar charges on colloidal particles provide stability to the colloidal sol and if, somehow, charge is removed, coagulation of sol occurs. Lyophobic sols are readily coagulated as compare to lyophilic sols. What is the reason for the charge on sol particles ?

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2. Read the given passage and answer the questions number 1 to 5 that follow :

Colloidal particles always carry an electric charge which may be either positive or negative. For example, when $AgNO_3$ solution is added to Kl solution, a negatively charged colloidal sol is obtained. The presence of equal and similar charges on colloidal particles provide stability to the colloidal sol and if, somehow, charge is removed, coagulation of sol occurs. Lyophobic sols are readily coagulated as compare to lyophilic sols. Why the presence of equal and similar charges on colloidal particles provide stability ?

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3. Read the given passage and answer the questions number 1 to 5 that follow :

Colloidal particles always carry an electric charge which may be either

positive or negative. For example, when $AgNO_3$ solution is added to Kl solution, a negatively charged colloidal sol is obtained. The presence of equal and similar charges on colloidal particles provide stability to the colloidal sol and if, somehow, charge is removed, coagulation of sol occurs. Lyophobic sols are readily coagulated as compare to lyophilic sols. Why a negatively charged sol is obtained on adding $AgNO_3$ solution to KI solution ?

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4. Read the given passage and answer the questions number 1 to 5 that follow :

Colloidal particles always carry an electric charge which may be either positive or negative. For example, when $AgNO_3$ solution is added to Kl solution, a negatively charged colloidal sol is obtained. The presence of equal and similar charges on colloidal particles provide stability to the colloidal sol and if, somehow, charge is removed, coagulation of sol occurs. Lyophobic sols are readily coagulated as compare to lyophilic sols.

Name one method by which coagulation of lyophobic sol can be carried out.

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5. Read the given passage and answer the questions number 1 to 5 that follow :

Colloidal particles always carry an electric charge which may be either positive or negative. For example, when $AgNO_3$ solution is added to Kl solution, a negatively charged colloidal sol is obtained. The presence of equal and similar charges on colloidal particles provide stability to the colloidal sol and if, somehow, charge is removed, coagulation of sol occurs. Lyophobic sols are readily coagulated as compare to lyophilic sols. Out of KI or K_2SO_4, which electrolyte is better in the configuration of positive sol ?

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6. Name the method applied for the concentration of Bauxite ore in the extraction of Aluminium.

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7. Out of

which one is more reactive towards S_N1 reaction?

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8. Write an isomer of C_3H_9N which gives foul smell of isocyanide when treated with chloroform and ethanolic NaOH.

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9. Which one of the following is an antidepressant drug ?

Chloramphenicol, Luminal, Bithional

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10. Write the name of component of starch which is water soluble.

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11. How many ions are produced from the complex $\left[Co(NH_3)_5CI\right]CI_2$ in solution?

A. 4

B. 2

C. 3

D. 5

Answer: C

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12. In a lead storage battery

A. PbO_2 is reduced to $PbSO_4$ at the cathode.

B. Pb is oxidised to $PbSO_4$ at the anode.

C. Both electrodes are immersed in the same aqueous solution of H_2SO_4.

D. All the above are true.

Answer: D

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13. The slope in the plot of $\ln[R]$ vs. time gives

(where [R] is the final concentration of reactant.)

A. $+k$

B. $\frac{+k}{2.303}$

C. $-k$

D. $\frac{-k}{2.303}$

Answer: C

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14. The pair $\left[Co(NH_3)_4CI_2\right]Br_2$ and $\left[Co(NH_3)_4\right]CI_2$ will show

A. Linkage isomerism.

B. Hydrate isomerism.

C. Ionisation isomerism.

D. Coordinate isomerism.

Answer: C

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15. An α-helix is a structural feature of

A. Sucrose.

B. Polypeptides.

C. Nucleotides.

D. Starch.

Answer: B

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16. Assertion (A) : F_2 is a strong oxidising agent.

Reason (R) : Electron gain enthalpy of fluorine is less negative.

A. Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B. Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C. Assertion (A) is correct, but Reason (R) is incorrect statement.

D. Assertion (A) is incorrect, but Reason (R) is correct statement.

Answer: B

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17. Assertion (A) : $(CH_3)_3C-O-CH_3$ gives $(CH_3)_3C-I$ and CH_3OH on treatment with HI.

Reason (R) : The reaction occurs by S_N1 mechanism.

A. Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B. Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C. Assertion (A) is correct, but Reason (R) is incorrect statement.

D. Assertion (A) is incorrect, but Reason (R) is correct statement.

Answer: A

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18. Assertion (A) : Transition metals have low melting points.

Reason (R) : The involvement of greater number of $(n-1)d$ and ns electrons in the interatomic metallic bonding.

A. Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B. Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C. Assertion (A) is correct, but Reason (R) is incorrect statement.

D. Assertion (A) is incorrect, but Reason (R) is correct statement.

Answer: D

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19. Assertion (A) : Hydrolysis of an ester follows first order kinetics.

Reason (R) : Concentration of water remains nearly constant during the course of the reaction.

A. Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B. Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C. Assertion (A) is correct, but Reason (R) is incorrect statement.

D. Assertion (A) is incorrect, but Reason (R) is correct statement.

Answer: A

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20. Assertion (A) : Benzoic acid does not undergo Friedal-Crafts reaction.

Reason (R) : The carboxyl group is activating and undergo electrophilic

substitution reaction.

A. Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).

B. Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is not the correct explanation of the Assertion (A).

C. Assertion (A) is correct, but Reason (R) is incorrect statement.

D. Assertion (A) is incorrect, but Reason (R) is correct statement.

Answer: C

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Section B

1. What happens when

(i) a pressure greater than the osmotic pressure is applied on the

solution side separated from solvent by a semipermeable membrane ?

(ii) acetone is added to pure ethanol ?

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2. Write the principle of the following refining methods :

(a) vapour phase refining

(b) chromatography

OR

Write chemical equations involved to obtain :

(i) Cu from Cu_2S

(ii) Ag from $\left[Ag(CN)_2\right]^-$ complex

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3. Write the balanced chemical equations involved in the preparation of $KMnO_4$ from pyrolusite ore (MnO_2).

OR

Write the balanced ionic equations showing the oxidising action of

acidified dichromate $\left[Cr_2O_7^{2-}\right]$ solution with (i) Iron (II) Ion and (ii) Tin (II) ion.

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4. Write the IUPAC names and hybridisation of the following complexes :

(i) $\left[Ni(CN)_4\right]^{2-}$

(ii) $\left[Fe(H_2O)_6\right]^{2+}$

(Given : Atomic number $Ni = 28$, $Fe = 26$)

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5. Define the following terms with a suitable example in each:

(i) Antibiotics (ii) Antiseptics

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6. Write the reactions showing the presence of following in the open structure of glucose :

(i) A carbonyl group (ii) Straight chain with six carbon atoms

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7. State Henry's law. Calculate the solubility of CO_2 in water at 298 K under 760 mm Hg. [K_H for CO_2 in water at 298K is 1.25×10^6 mm Hg]

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Section C

1. The freezing point of a solution containing 5g of benzoic acid $\left(M = 122 gmol^{-1}\right)$ in 35g of benzene is depressed by 2.94 K. What is the percentage association of benzoic acid if it forms a dimer in solution. [K_f for benzene = 4.9 K kg mol^{-1}]

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2. The rate constant for the first order decomposition of N_2O_5 is given by the following equation: $k = \left(2.5 \times 10^{14} s^{-1}\right) e^{(-25000K)/T}$

Calculate E_a for this reaction and rate constant if its half-life period be 300 minutes.

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3. Write the name and structures of monomer(s) in the following polymers :

(i) Nylon 6 (ii) PVC (iii) Neoprene

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4. Following ions are given :

$Cr^{2+}, Cu^{2+}, Cu^{+}, Fe^{2+}, Fe^{3+}, Mn^{3+}$

Identify the ion which is

(i) a strong reducing agent.

(ii) unstable in aqueous solution.

(iii) a strong oxidising agent.

Give suitable reason in each.

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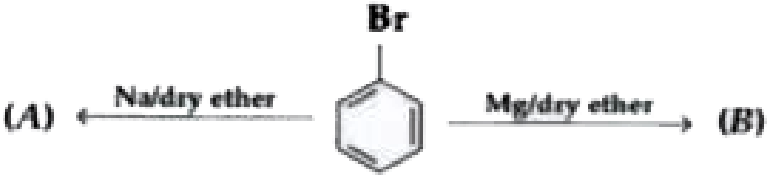
5. (i) Write the structure of major alkene formed by β-elimination of 2, 2, 3-trimethyl-3- bromopentane with sodium ethoxide in ethanol.

(ii) Which one of the compounds in the following pairs is chiral ?

(iii) Identify (A) and (B) in the following :



OR

How can you convert the following ?

(i) But-1-ene to 1-iodobutane

(ii) Benzene to acetophenone

(iii) Ethanol to propanenitrile

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6. Arrange the following compounds as directed :

(i) In increasing order of solubility in water :

$(CH_3)_2.\ NH, CH_3NH_2, C_6H_5NH_2$

(ii) In decreasing order of basic strength in aqueous solution :

$(CH_3)_3N, (CH_3)_2NH, CH_3NH_2$

(iii) In increasing order of boiling point :

$(C_2H_5)_2NH, (C_2H_5)_3N, C_2H_5NH_2$

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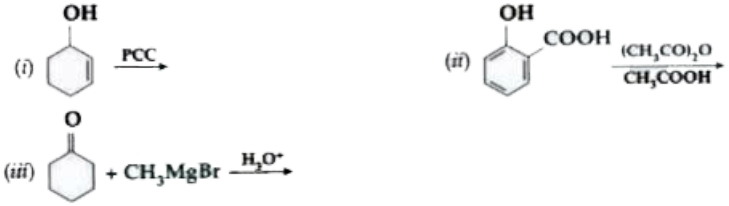
7. Write the product(s) of the following reaction :



OR

(a) Write the mechanism of the following S_N1 reaction :

$$(CH_3)_3C - Br \xrightarrow{Aq.NaOH} (CH_3)_3C - OH + NaBr$$

(b) Write the equation for the preparation of 2-methyl-2-methoxypropane by Williamson synthesis.

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Section D

1. (a) The electrical resistance of a column of $0.05MKOH$ solution of length 50 cm and area of cross-section $0.625cm^2$ is 5×10^3 ohm. Calculate its resistivity, conductivity and molar conductivity.

(b) Predict the products of electrolysis of an aqueous solution of $CuCI_2$

with platinum electrodes.

[Given :

$E^o_{Cu^{2+}/Cu} = +0.34V, E^o_{\left(\frac{1}{2}CI_2/CI^-\right)} = +1.36V, E^o_{H^+/H_2(g),Pt} = 0.00V,$

]

OR

(a) Calculate e.m.f. of the following cell :

$Zn(s)/Zn^{2+}(0.1M) \mid \mid (0.01M)Ag^+/Ag(s)$

[Given : $E^o_{Zn^{2+}/Zn} = -0.76V, E^o_{Ag^+/Ag} = +0.80V, \log 10 = 1$]

(b) X and Y are two electrolytes. On dilution molar conductivity of 'X' increases 2.5 times while that Y increases 25 times. Which of the two is a weak electrolyte and why ?

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2. (a) An organic compound (A) having molecular formula C_4H_8O gives orange red precipitate with 2, 4-DNP reagent. It does not reduce Tollens' reagent but gives yellow precipitate of iodoform on heating with $NaOH$ and I_2. Compound (A) on reduction with $NaBH_4$ gives compound (B) which undergoes dehydration reaction on heating with cone. H_2SO_4 to

form compound (C). Compound (C) on ozonolysis gives two molecules of ethanal.

Identify (A), (B) and (C) and write their structures. Write the reactions of compound (A) with (i) $NaOH / I_2$ and (ii) $NaBH_4$.

(b) Give reasons :

(i) Oxidation of propanal is easier than propanone.

(ii) α-hydrogen of aldehydes and ketones is acidic in nature.

Or

(a) Draw structures of the following derivatives :

(i) Cyanohydrin of cyclobutanone

(ii) Hemiacetal of ethanal

(b) Write the major product(s) in the following :

(i) $CH_3 - CH = CH - CH_2 - CN \xrightarrow[(ii)\, H_3O^+]{(i)\, \mathrm{DIBAL} - H} (ii)$CH_(3) - CH_(2) - OH overset(CrO_(2)) (to)

(c) How can you distinguish between propanal and propanone ?

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3. (a) Account for the following :

(i) Tendency to show - 2 oxidation state decreases from oxygen to tellurium.

(ii) Acidic character increases from HF to HI.

(iii) Moist SO_2 gas acts as a reducing agent.

(b) Draw the structure of an oxoacid of phosphorus containing P - O - P linkage.

(c) Complete the following equation :

$XeF_2 + H_2O \rightarrow$

OR

(a) Among the hydrides of group 16, write the hydride

(i) which is a strong reducing agent ?

(ii) which has maximum bond angle ?

(iii) which is most thermally stable ?

Give suitable reason in each.

(b) Complete the following equations :

$AgNO_3 + H_2O + H_3PO_2 \rightarrow$

(c) $CI_2 + \underset{\text{(Cold and dilute)}}{N} aOH \rightarrow$

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