CHEMISTRY

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 05

Section A

1. What are the product obtained when ammonia is reacted with excess of bromine:

A. N_2 and NBr_3

B. NBr_3 and HBr

C. N_2 and HBr

D. N_2 and NH_4Br

Answer: B

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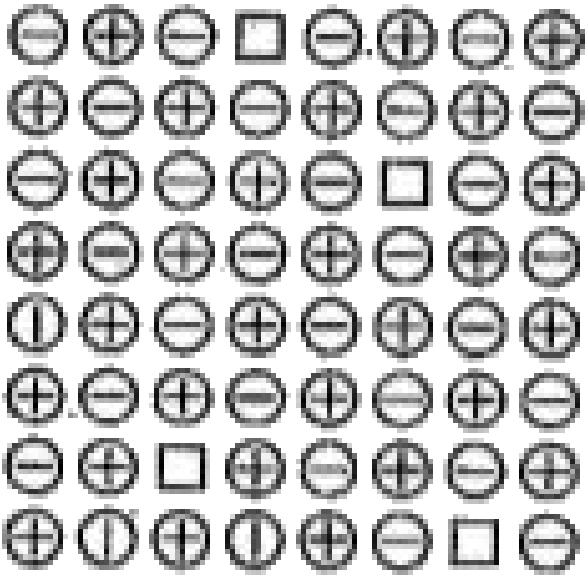
2. In the given figure, which defect is shown?



A. Interstitial defect

B. Metal deficiency defect

C. Frenkel defect

D. Schottky defect

Answer: D

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3. Mole fraction of the solute in a 1.0 molal aqueous solution is:

A. 1.8

B. 0.0177

C. 0.05

D. 0.098

Answer: B

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4. If a is the length of the side of a cube, the distance between the body centred atom and one corner atom in the cube will be:

A. $\frac{2}{\sqrt{2}}a$

B. $\frac{\sqrt{3}}{2}a$

C. $\frac{4}{\sqrt{3}}a$

D. $\frac{\sqrt{3}}{4}a$

Answer: B

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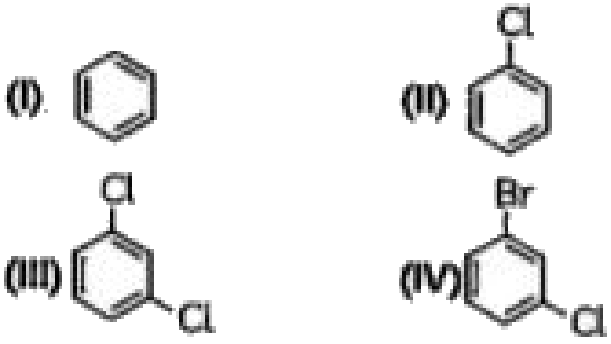
5. The increasing order of densities of given compound is:



A. $(I) < (II) < (III) < (IV)$

B. $(II) < (IV) < (III) < (I)$

C. $(IV) < (III) < (II) < (I)$

D. $(I) < (III) < (IV) < (II)$

Answer: A

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6. Glucose cannot be classified as

A. a hexose

B. a carbohydrate

C. an aldose

D. an oligosaccharide

Answer: D

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7. Among the following compounds which will be steam volatile:

A. Phenol

B. p-nitrophenol

C. o-nitrophenol

D. m-nitropheneol

Answer: C

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8. Which of the following does not exist?

A. $XeOF_4$

B. NeF_2

C. XeF_2

D. XeF_6

Answer: B

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9. The functional group that is present in paper, cotton and sugar is:

A. RX group

B. $-OH$ group

C. $-COOR$ group

D. $-NH_2$ group

Answer: B

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10. Which type of solids are good conductor of electricity and are in malleable in nature?

A. Ionic solids

B. Metallic solids

C. Molecular solids

D. Amorphous solids

Answer: B

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11. In Nucleophilic substitution reactions halides are less reactive due to :

A. inductive effect in aryl halides

B. resonance stabilisation in aryl halides

C. precence of double bonds in aryl halides

D. formation of a less stable cation in aryl halides

Answer: B

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12. Raw meat is is preserved by adding a small amount of salt to it. The bacteria responsible for spoiling .....

A. it loses water due to reverse osmosis and gets destroyed

B. it gains water due to reverse osmosis and gets destroyed

C. it loses water due to osmosis and gets destroyed

D. it gains water due to osmosis and gets destroyed

Answer: C

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13. The incorrect statement for alcohol is:

A. The-OH group is alcohols is involved in hydrogen bonding

B. Lower members have a pleasant smell and higher members are colourless and tasteless

C. Lower members are insoluble in water and organic solvents but the solubility

regularly increases with molecular mass

D. Their boiling points rise fairly uniformly with rising molecular weight

Answer: c

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14. Which is not hydrolysed by water:

A. NCl_3

B. NF_3

C. PCl_3

D. $BiCl_3$

Answer: B

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15. Invert sugar is:

A. A type of cane sugar

B. An optically inactive form of sugar

C. mixture of glucose and galactose

D. mixture of glucose and fructose in equimolar quantities

Answer: D

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16. Racemisation occurs in:

A. $S_N 2$

B. $S_N 1$

C. Neither $S_N 2 \text{nor} S_N 1.$

D. S_N2 reaction as well as S_N1 reaction

Answer: B

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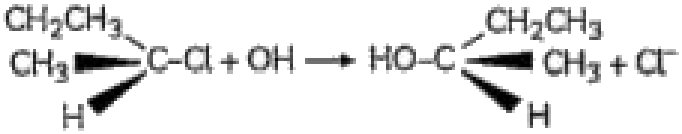
17. For the given reaction



The correct statement is :

A. The reaction proceeds via S_N2 mechanism hence inversion of

configuration takes place

B. The reaction proceeds via S_N1 mechanism hence there is no change in the configuration.

C. The reaction proceeds via S_N2 mechanism hence there is no change in the configuration.

D. The reaction proceeds via S_N1 mechanism hence inversion of configuration takes place.

Answer: A

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18. In the given halides, bond length is maximum in:

A. HBr

B. HI

C. HCl

D. HF

Answer: B

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19. 15 g of methyl alcohol is dissolved in 35 g of water. The mass percentage of methyl alcohol in solution is:

A. $35\ \%$

B. $30\ \%$

C. $45\ \%$

D. $40\ \%$

Answer: B

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20. An element 'A' burns in nitrogen to give an ionic compound 'B' which reacts with water to give 'C' and D. 'E' is used in white washing. Identify, A, B, C and D:

A. $Ca, Cl_2, Ca(OH)_2, N_2$

B. $Ca, Ca_3N_2, Ca(OH)_2, NH_3$

C. $Ca, Ca(OH)_2, CaCO_3, NH_3$

D. $Ca, Cl_2, Ca(OH)_2, NH_3$

Answer: B

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21. DNA is different from RNA because DNA contains:

A. ribose sugar and thymine

B. ribose sugar and uracil

C. deoxyribose sugar and thymine

D. deoxyribose sugar and uracil

Answer: C

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22. Which is the least basic

A. NF_3

B. NCl_3

C. NBr_3

D. NI_3

Answer: A

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23. Which of the following pairs will produce anisole?

A. $C_6H_5CH_3, C_6H_4COCl$ and $AlCl_3$

B. $C_6H_5OH, NaOH$ and CH_3I

C. C_6H_6OH and $FeCl_3$

D. CH_3CHO and $RMgX$

Answer: B

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24. The total number of electron pairs of some xenon complexes are as follows :

S. No.	Complex	Number of electron pairs
1	XeF_2	5
2	XeF_6	7
3	XeF_4	6

Which complex is linear in shape :

A. XeF_6

B. XeF_2

C. XeF_4

D. Both XeF_2 and XeF_6

Answer: B

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25. A 5% solution of cane sugar (molecular weight=342) is isotonic with 1% solution of substance X.The molecular weight of X is

A. 74.2

B. 138.4

C. 68.4

D. 171.2

Answer: C

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Section B

1. Calculate the freezing point of a solution containing 60 g glucose (Molar mass = 180 g mol^{-1}) in 250 g of water . (K_f of water = $1.86 K kg mol^{-1}$)

A. 271.67 K

B. 270.67 K

C. 274 K

D. 270 K

Answer: B

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2. Number of monochloro derivatives obtained when neo-pentane chlorinated

A. 1

B. 2

C. 3

D. 4

Answer: A

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3. Ammonia compound which upon heating does not give ammonia is:

A. $(NH_4)_2SO_4$

B. $(NH_4)_2CO_3$

C. NH_4NO_2

D. NH_4Cl

Answer: C

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4. Which of the following is correct about H-bonding in nucleotide?

A. $A-T, G-C$

B. $A-G, T-C$

C. $G-T, A-C$

D. $A-A, T-T$

Answer: A

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5. The alcohol which does not react with Lucas reagent is:

A. isobutyl alcohol

B. n-butanol

C. tert-butyl alcohol

D. sec-butyl alcohol

Answer: B

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6. The boiling points of hydrides of group 16 are in the order

A. $H_2O > H_2Te > H_2S > H_2Se$

B. $H_2O > H_2S > H_2Se > H_2Te$

C. $H_2O > H_2Te > H_2Se > H_2S$

D. $H_2Te > H_2S > H_2Se > H_2O$

Answer: C

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7. A binary solid $\left(A^{+}B^{-}\right)$ has a zinc blende stracture with B ions constituting the lattice and A^{+} inos occupying $25\,\%$ of the terahedral holes. The formula of the solid is

A. AB

B. AB_2

C. A_2B

D. AB_4

Answer: B

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8. Which among the following forms a linear polymeric structure due to hydrogen bonding?

A. Hydrogen sulphide

B. Hydrogen fluoride

C. Hydrogen sulphate

D. Both (a) and (b)

Answer: B

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9. The unit of ebullioscopic constant is

A. $Kg \quad \mathrm{mol}^{-1}$

B. K kg mol

C. K kg mol^{-1}

D. K g mol

Answer: C

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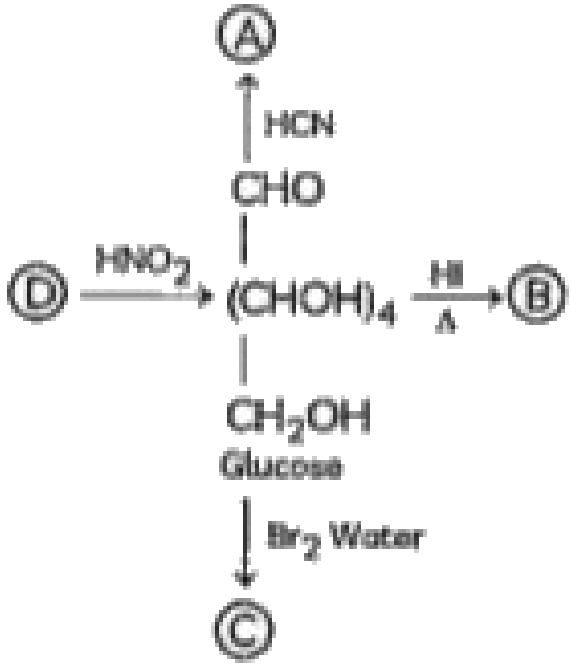
10. In the given reaction :



A, B, C and D respectively are:

A. n-hexane gluconic acid, saccharic acid and glucose cyanohydrin

B. saccharic acid, glucose cyanohydin, n-hexane, gluconic acid

C. glucose cyanohydrin, n-hexane, gluconic acid, saccharic acid

D. n-hexane, gluconic acid, glucose cyanohydrin, saccharic acid

Answer: C

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11. Which of the following is most reactive towards S_N1 reaction?

A. $C_6H_5C(CH_3)C_6H_5Br$

B. $C_8H_5CH_2Br$

C. $C_6H_5CH9(C_6H_5)Br$

D. $C_6H_5CH(CH_3)Br$

Answer: A

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12. What will be the ratio of the total volume of bcc to simple cubic structure is?

A. $3\sqrt{3}:8$

B. $1:24\sqrt{3}$

C. $24\sqrt{3}:1$

D. $8:3\sqrt{3}$

Answer: D

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13. Nitrogen is used to fill electric bulb because:

A. it is lighter then air

B. it makes the bulb glow

C. it is non toxic

D. it does not support combustion

Answer: D

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14. The reagent that is used to convert phenol into benzene is:

A. Zn dust

B. CO_2

C. $CHCl_2 / aqNaOH$

D. Na_2CrO_2 / H_2SO_4

Answer: B

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15. IUPAC name of the compund

$$CH_3 - \underset{\underset{CH_3}{|}}{CH} - OCH_3$$ is

A. 2-methoxypropane

B. 2-methoxy-2-methylethane

C. 1-methoxy-1-methylethane

D. isopropyl methyl ether

Answer: A

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16. The correct order of $\Delta_i H_1$ values is:

A. $He < Ne > Ar = Kr > Xe > Rn$

B. $He < Ne < Ar < Kr < Xe < Rn$

C. $He > Ne > Ar > Kr > Xe > Rn$

D. He= Ne gt Ar gt Kr gt Xe gt Rn`

Answer: C

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17. What happens when 1-Propanol in the presence of HBF_4 reacts with diazomethane?

A. di-n-propyl ether

B. dimethyl ether

C. 1-methaxypropane

D. 2 methaxypropane

Answer: C

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18. Halogenation, sulphonation, Friedel-Craft's reaction of haloarenes is an example of:

A. addition reaction of benzene

B. electrophilic substitution reaction benzene

C. nucleophilic substitution reaction benzene

D. elimination reaction of benzene

Answer: B

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19. Assertion (A): The reducing nature of hydrides of group 16 varies in the order:

$H_2O < H_2S < H_2Se < H_2Te$

Reason (R): The bond dissociation enthalpy of hydrides of group 16 decreases in the order:

$H_2O > H_2S > H_2Se > H_2Te.$

A. Both A and Rare true and R is the correct explanation of A

B. Both A and Rare true but Ris not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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20. Assertion (A) Hydrolysis of (-)-2-bromooctane proceeds with inversion of configuration

Reason (R) This reaction proceeds through the formation of a carbocation.

A. Both A and Rare true and R is the correct explanation of A

B. Both A and Rare true but Ris not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C

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21. Assertion (A): Soft drinks are seated under high pressure to increase the solublility of CO_2.

Reason (R): Raoult's law states that, the vapour pressure of a non volatile component in a given solution is given by $p_i = x_i p_i$

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C

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22. Assertion (A): Nitric oxide on heating becomes yellowish brown in colour.

Reason (R): On oxidation NO oxidises into yellow brown coloured NO_2.

A. Both A and Rare true and R is the correct explanation of A

B. Both A and Rare true but Ris not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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23. Assertion : Azeotropic mixtures are formed only by non - ideal solutions and they may have boiling points either greater than both the components or less than both the compontents.

Reason : The c omposition of the vapour phase is same as that of the liquid phase of an azeotropic mixture.

A. Both A and Rare true and R is the correct explanation of A

B. Both A and Rare true but Ris not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C

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Section C

1. Match the following

Column I	Column II
(I) Cellulose	(A) Protein
(II) Maltose	(B) β-isomer
(III) Amylose	(C) α-isomer
(IV) Glucagon	(D) Reducing sugar

Which of the following is best matched :

A. (I)-(D) , (II)-(C) , (III)-(B) , (IV) - (A)

B. (I) - (B) , (II)-(C) , (III)-(D) , (IV) -(A)

C. (I)-(B) , (II)-(D) , (III) -(C) , (IV) -(A)

D. (I)-(C) , (II)-(D) , (III) -(B) , (IV)-(A)

Answer: C

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2. Which of the following analogies is correct:

A. Oxygen : $1s^2 2s^2 2p^4$:: Nitrogen : $1s^2 2s^2 2p^5$

B. $(CN)_2$: Pseudohalogen :: ClF : Halogen

C. Cl_2 : as germicide :: HCl : as extracting glue

D. N_2: Linear :: O_3: Trigonal planar

Answer: D

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3. Complete the following analogy:

Two different electron donor site (A) :: Inversion of configuration:

A. A : ambidentate nucleophile $B: S_N^2$ reaction.

B. A: Bidentate nucleophile B: S_N^1 reaction

C. A: Unidentate nucleophile B: E_1 reaction

D. A : Polydentate Nucleophile B : Substitution reaction

Answer: A

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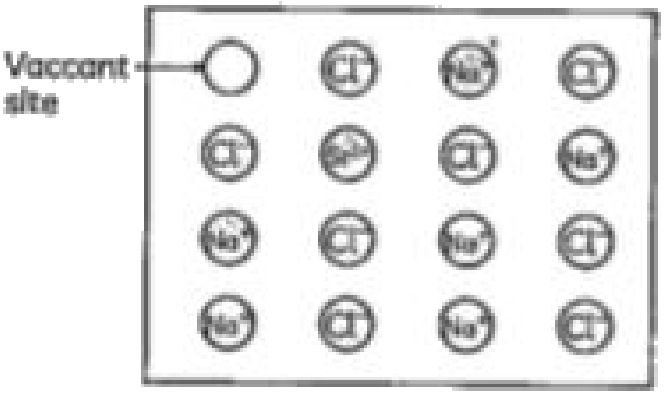
4. Impurity Defects arises when foreign atoms are present at the lattice site in place of the host atom. For example in the molten state, NaCl contains small amount of $SrCl_2$ in the form of impurity in the crystal Due to the

presence of $SrCl_2$ some site of Na^+ ion is occupied by Sr^{2+}. For maintaining the neutrality of the crystal one Sr^{2+} replaces two ions of Nat and the remaining one site of Na^+ will be vacant.



When electrons are trapped in the crystal in the anionic vacancy the defect is:

A. Schottky defect

B. Frenkel defect

C. Sterchiometric defect

D. F-centres

Answer: D

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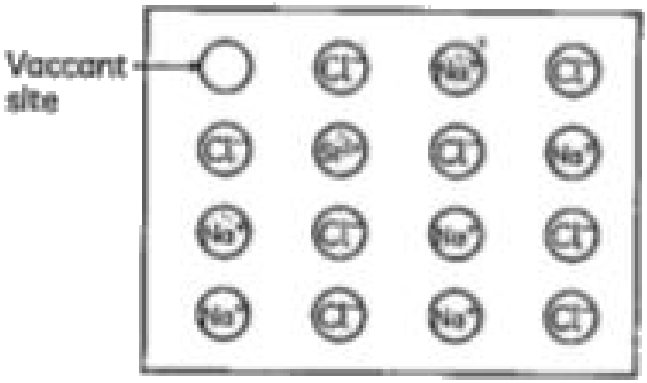

If NaCl is doped with 10^{-4} mole percent of $SrCl_2$, the concentration of cation vacancies will be:

A. $6.022 \times 10^{16} mol^{-1}$

B. $6.022 \times 10^{17} mol^{-1}$

C. $6.022 \times 10^{14} mol^{-1}$

D. $6.022 \times 10^{15} mol^{-1}$

Answer: B

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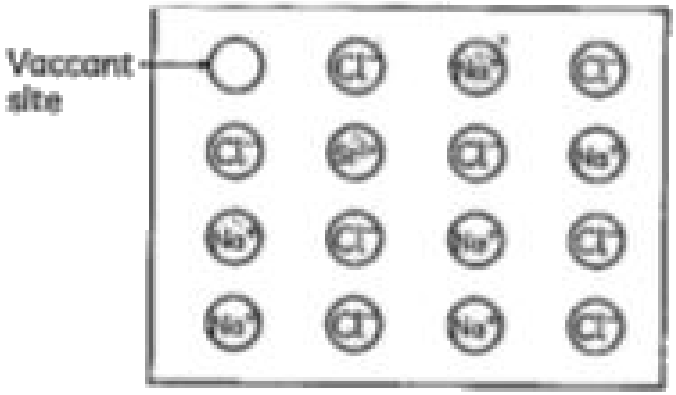
6. Impurity Defects arises when foreign atoms are present at the lattice site in place of the host atom. For example in the molten state,

NaCl contains small amount of $SrCl_2$ in the form of impurity in the crystal Due to the presence of $SrCl_2$ some site of Na^+ ion is occupied by Sr^{2+}. For maintaining the neutrality of the crystal one Sr^{2+} replaces two ions of Nat and the remaining one site of Na^+ will be vacant.



The appeareance of colour in solid alkali metal balide is generally due to :

A. Interstitial position

B. F-centres

C. Schottky defect

D. Frenkel defect

Answer: B

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