Solid State 223

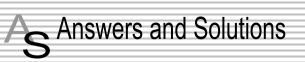


(SET -5)

Solid State

ET Self Evaluation Test -5

		7.	The second order Bragg's diffraction of X – rays with $\lambda = 1 A$			
	(a) Electrical attraction forces		from a set of parallel planes in a metal occurs at an angle of $ 60^{o}. $			
	(b) Vander Waal's forces		The distance between the scattering planes in the crystal is[CBSE PMT is]			
	(c) Covalent bond forces		(a) 0.575 \mathring{A} (b) 1.00 \mathring{A}			
	(d) Strong electrostatic attraction forces		(c) $2.00 \mathring{A}$ (d) $1.15 \mathring{A}$			
•	Crystals of covalent compounds always have [BHU 1984]					
	(a) Atoms as their structural units	8.	The edge length of the unit cell of <i>NaCl</i> crystal lattice is			
	(b) Molecules as structural units		552 pm. If ionic radius of sodium ion is 95 pm, what is the			
	(c) lons held together by electrostatic forces		ionic radius of chloride ion [KCET 1998]			
	(d) High melting points		(a) 190 pm (b) 368 pm			
}.	Wax is an example of		(c) 181 pm (d) 276 pm			
	(a) lonic crystal (b) Covalent crystal	9.	The ionic radii of Rb^+ and I^- are 1.46 Å and 2.16Å. the most			
	(c) Metallic crystal (d) Molecular crystal		probable type of structure exhibited by it is			
•	Among the following which crystal will be soft and have low melting point		[UPSEAT 2004]			
	(a) Covalent (b) Ionic		(a) $CsCl$ type (b) ZnS type			
	(c) Metallic (d) Molecular		(c) $NaCl$ type (d) CaF_2 type			
	In zinc blende structure, zinc atom fill up		The coordination number of a cation occupying a tetrahedral hole is			
	(a) All octahedral holes		(a) 6 (b) 8			
	(b) All tetrahedral holes	11.	(c) 12 (d) 4			
	(c) Half number of octahedral holes		If a electron is present in place of anion in a crystal lattice, then it is			
	(d) Half number of tetrahedral holes		called			
•	Which ion has the lowest radius from the following ions		(a) Frenkel defect			
	[Kurukshetra CEE 1998]		(b) Schottky defect			
	(a) Na^+ (b) Mg^{2+}		(c) Interstitial defects			
	(c) Al^{3+} (d) Si^{4+}		(d) F – centre			



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(c)	Quartz is a covalent solid in which constituent particles are atoms which are held together by covalent bond forces.	10.	(d)	The co-ordination number of a cation occupying a tetrahedral hole is 4.
(a)	Constituent particles of covalent compounds are atoms.	11.	(d)	When electrons are trapped in anion vacancies, these are calle <i>F</i> -centres.
(d)	lodine crystals are molecular crystals, in which constituent particles are molecules having interparticle forces are Vander Waal's forces.			
(d)	Molecular crystals are soft and have low melting point.			
(d)	In zinc blende (ZnS) half number of tetrahedral holes are filled by zinc atoms.			
(d)	All are the iso-electronic species but Si^{4+} has high positive charge so have lowest radius.			
(d)	$2d\sin\theta = n\lambda$ or $2 \times d \times \sin 60^\circ = 2 \times 1 \text{ Å}$			
	or $2 \times d \times 0.8660 = 2$			
	or $d = 1.15 \text{\AA}$ (sin 60° = $\sqrt{3}$ / 2 or 0.8660).			

8. (c) Distance between centres of Na^+ and Cl^-

 $r_{Na^+} + r_{Cl^-} = 276 \, pm$ or $95 + r_{Cl^-} = 276 \, pm$

or
$$r_{Cl^-} = 276 - 95 = 181 \, pm$$

9. (c)
$$\frac{r_{c^+}}{r_{a^-}} = \frac{1.46}{2.16} = 0.676$$

Concentration and the

It permits co-ordination number 6 and octahedral structure of type $\ NaCl$.