



13. In a face centred cubic lattice, atoms of A form the corner points and atoms of B form the face centred points. If two atoms of A are missing from the corner points, the formula of the ionic compound is

[JEE-Main (online)-13]

- (1)
- $AB_2$
- (2)
- $AB_3$
- (3)
- $AB_4$
- (4)
- $A_2B_5$

14. Which one of the following statements about packing in solids is **incorrect** ?

[JEE-Main (online)-13]

- (1) Void space in ccp mode of packing is 26%
- 
- (2) Coordination number in hcp mode of packing is 12
- 
- (3) Void space in hcp mode of packing is 32%
- 
- (4) Coordination number in bcc mode of packing is 8

15. An element having an atomic radius of 0.14 nm crystallizes in an fcc unit cell. What is the length of a side of the cell ?

[JEE-Main (online)-13]

- (1) 0.96 nm (2) 0.4 nm
- 
- (3) 0.24 nm (4) 0.56 nm

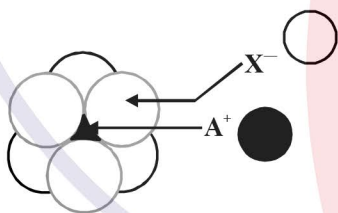
16. Experimentally it was found that a metal oxide has formula  $M_{0.98}O$ . Metal M, is present as  $M^{2+}$  and  $M^{3+}$  in its oxide. Fraction of the metal which exists as  $M^{3+}$  would be :-

[JEE-Main (offline)-13]

- (1) 7.01% (2) 4.08%
- 
- (3) 6.05% (4) 5.08

17. The arrangement of  $X^-$  ions around  $A^+$  ion in solid AX is given in the figure (not drawn to scale). If the radius of  $X^-$  is 250 pm, the radius of  $A^+$  is -

[JEE-2013]



- (1) 104 pm (2) 125 pm
- 
- (3) 183 pm (4) 57 pm

18. The total number of octahedral void(s) per atom present in a cubic close packed structure is :-

[JEE-Main (online)-14]

- (1) 1 (2) 2 (3) 3 (4) 4

19. In a monoclinic unit cell, the relation of sides and angles are respectively

[JEE-Main (online)-14]

- (1)
- $a \neq b \neq c$
- and
- $\alpha \neq \beta \neq \gamma \neq 90^\circ$
- 
- (2)
- $a \neq b \neq c$
- and
- $\beta = \gamma = 90^\circ \neq \alpha$
- 
- (3)
- $a = b \neq c$
- and
- $\alpha = \beta = \gamma = 90^\circ$
- 
- (4)
- $a \neq b \neq c$
- and
- $\alpha = \beta = \gamma = 90^\circ$

20. The appearance of colour in solid alkali metal halides is generally due to :

[JEE-Main (online)-14]

- (1) Frenkel defect
- 
- (2) F-centres
- 
- (3) Schottky defect
- 
- (4) Interstitial position

21. In a face centred cubic lattice atoms A are at the corner points and atoms B at the face centred points. If atom B is missing from one of the face centred points, the formula of the ionic compound is :

[AIEEE-2011, JEE-Main (online)-14]

- (1)
- $AB_2$
- (2)
- $A_2B_3$
- 
- (3)
- $A_5B_2$
- (4)
- $A_2B_5$

22. CsCl crystallises in body centred cubic lattice. if 'a' is its edge length then which of the following expression is correct :

[JEE-Main (offline)-14]

- (1)
- $r_{Cs^+} + r_{Cl^-} = \frac{\sqrt{3}}{2}a$
- (2)
- $r_{Cs^+} + r_{Cl^-} = \sqrt{3}a$
- 
- (3)
- $r_{Cs^+} + r_{Cl^-} = 3a$
- (4)
- $r_{Cs^+} + r_{Cl^-} = \frac{3a}{2}$

23. Sodium metal crystallizes in a body centred cubic lattice with a unit cell edge of 4.29Å. The radius of sodium atom is approximately :-

[JEE-Main (offline)-15]

- (1) 5.72Å (2) 0.93Å
- 
- (3) 1.86Å (4) 3.022Å

24. If the unit cell of a mineral has cubic close packed (ccp) array of oxygen atoms with m fraction of octahedral holes occupied by aluminium ions and n fraction of tetrahedral holes occupied by magnesium ions m and n respectively, are -

[JEE-2015]

- (1)
- $\frac{1}{2}, \frac{1}{8}$
- (2)
- $1, \frac{1}{4}$
- 
- (3)
- $\frac{1}{2}, \frac{1}{2}$
- (4)
- $\frac{1}{4}, \frac{1}{8}$

25. Which of the following compounds is metallic and ferromagnetic ?

[JEE-Main (offline)-16]

- (1)
- $MnO_2$
- (2)
- $TiO_2$
- 
- (3)
- $CrO_2$
- (4)
- $VO_2$

26. The **CORRECT** statement(s) for cubic close packed (ccp) three dimensional structure is (are)

[JEE-2016]

- (1) The number of the nearest neighbours of an atom present in the topmost layer is 12
- (2) The efficiency of atom packing is 74%
- (3) The number of octahedral and tetrahedral voids per atom are 1 and 2, respectively
- (4) The unit cell edge length is  $2\sqrt{2}$  times the radius of the atom

27. A metal crystallises in a face centred cubic structure. If the edge length of its unit cell is 'a', the closest approach between two atoms in metallic crystal will be :-

[JEE-Main (offline)-17]

- (1)  $2a$
- (2)  $2\sqrt{2}a$
- (3)  $\sqrt{2}a$
- (4)  $\frac{a}{\sqrt{2}}$

28. Which type of defect has the presence of cations in the interstitial sites -

[JEE-Main (offline)-18]

- (1) Vacancy defect
- (2) Frenkel defect
- (3) Metal deficiency defect
- (4) Schottky defect

29. All of the following share the same crystal structure except :-

[JEE-Main (online)-18]

- (1) RbCl
- (2) CsCl
- (3) LiCl
- (4) NaCl

30. Which of the following arrangements shows the schematic alignment of magnetic moments of antiferromagnetic substance ?

[JEE-Main (online)-18]

- (1)  $\uparrow \downarrow \downarrow \downarrow \downarrow \uparrow$
- (2)  $\uparrow \uparrow \uparrow \uparrow \uparrow \uparrow$
- (3)  $\uparrow \uparrow \downarrow \uparrow \uparrow \downarrow$
- (4)  $\uparrow \downarrow \uparrow \downarrow \uparrow \downarrow$

PREVIOUS YEARS QUESTIONS				ANSWER KEY				Exercise-II			
Que.	1	2	3	4	5	6	7	8	9	10	
Ans.	1.259	117.1 PM	216.59 PM	2	1	4	2	1	3	3	
Que.	11	12	13	14	15	16	17	18	19	20	
Ans.	1	2	3	3	2	2	1	1	2	2	
Que.	21	22	23	24	25	26	27	28	29	30	
Ans.	4	1	3	1	1	2,3,4	4	2	2	4	