

DATE 01-05-2016

CHEMISTRY - TEST
CLASS 12TH



TIME: 60 MIN
M. MARKS 120

SOLID STATE

In all Questions, 4 marks will be awarded for correct answer and -1 for every wrong attempt.

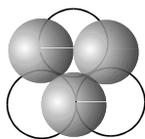
- Which of the following is/are pseudo solids ?
I. KCl
II. Barium chloride dihydrate
III. Rubber
IV. Solid cake left after distillation of coal tar
(A) I, III (B) II, III (C) III, IV (D) only III
- Amorphous solids may be classified as :
(A) isotropic and super-cooled liquids (B) anisotropic and super-cooled liquid
(C) isoenthalpic and super-heated liquid (D) isotropic and super-heated solids
- The solid with weakest intermolecular forces is :
(A) ice (B) phosphorus (C) naphthalene (D) sodium fluoride
- Choose the correct statements
(A) equivalent points in unit cells of a periodic lattice lie on a Bravais lattice
(B) equivalent points in unit cells of a periodic lattice do not lie on a Bravais lattice
(C) There are four Bravais lattices in two dimensions
(D) There are five Bravais lattices in three dimensions
- A match box exhibits
(A) cubic geometry (B) orthorhombic geometry
(C) triclinic geometry (D) monoclinic geometry
- Which of the following are the correct axial distance and axial angles for rhombohedral system?
(A) $a = b = c, \alpha = \beta = \gamma \neq 90^\circ$ (B) $a = b \neq c, \alpha = \beta = \gamma = 90^\circ$
(C) $a \neq b \neq c, \alpha = \beta = \gamma = 90^\circ$ (D) $a \neq b \neq c, \alpha \neq \beta \neq \gamma \neq 90^\circ$
- In a face centred cubic cell, the contribution of an atom at a face of the unit cell is
(A) 1/2 (B) 1 (C) 2 (D) 3
- A compound of A and B crystallizes in a cubic lattice in which A atoms occupy the lattice points at the corners of a cube and two atoms of B occupy the centers of each of the cube faces. What is the formula of this compound ?
(A) AB_3 (B) AB_4 (C) AB_2 (D) AB_6
- In a face centred lattice of X and Y, X atoms are present at the corners while Y atoms are at face centres. Then the formula of the compound is
(A) XY_3 (B) X_2Y_3 (C) X_3Y (D) XY
- In a face centred lattice of X and Y, X atoms are present at the corners while Y atoms are at face centres. Then the formula of the compound would be if one of the X atoms is missing from a corner in each unit cell
(A) X_7Y_{24} (B) $X_{24}Y_7$ (C) XY_{24} (D) $X_{24}Y$
- In a face centred lattice of X and Y, X atoms are present at the corners while Y atoms are at face centres. Then the formula of the compound would be if two atoms of X are missing from the corners,
(A) X_4Y (B) X_3Y_4 (C) XY_4 (D) X_2Y_4

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12. In a face centred lattice of X and Y, X atoms are present at the corners while Y atoms are at face centres. Then the formula of the compound would be if one of the X atoms from a corner is replaced by Z atoms (also monovalent) ?
 (A) $X_7Y_{24}Z_2$ (B) $X_7Y_{24}Z$ (C) $X_{24}Y_7Z$ (D) $XY_{24}Z$
13. A solid has a structure in which W atoms are located at the corners of a cubic lattice. O atom at the centre of the edges and Na atom at centre of the cubic. The formula for the compound is
 (A) $NaWO_2$ (B) $NaWO_3$ (C) Na_2WO_3 (D) $NaWO_4$
14. In a cubic structure of compound which is made from X and Y, where X atoms are at the corners of the cube and Y at the face centres of the cube. The molecular formula of compound is
 (A) X_2Y (B) X_3Y (C) XY_2 (D) XY_3
15. An element (atomic mass = 100 g/mole) having BCC structure has unit cell edge 400 pm. The density of the element is (no. of atoms in BCC(Z) = 2).
 (A) 2.144 g/cm³ (B) 5.188 g/cm³ (C) 7.289 g/cm³ (D) 10.376 g/cm³
16. Platinum crystallizes in a face-centered cubic crystal with a unit cell length 'a'. The distance between nearest neighbors is
 (A) a (B) $a \frac{\sqrt{3}}{2}$ (C) $a \frac{\sqrt{2}}{2}$ (D) $a \frac{\sqrt{2}}{4}$
17. Which one of the following schemes of ordering closed packed sheets of equal sized spheres does not generate close packed lattice.
 (A) ABCABC (B) ABACABAC (C) ABBAABBA (D) ABCBCABCBC
18. If the radius of a metal atom is 2.00 Å and its crystal structure is cubic close packed (fcc lattice), what is the volume (in cm³) of one unit cell ?
 (A) 8.00×10^{-24} (B) 1.60×10^{-23} (C) 1.80×10^{-22} (D) 2.26×10^{-23}
19. Platinum crystallises in a face centred cube crystal with a unit cell length of 3.9231 Å. The density and atomic radius of platinum are respectively.
 (A) 45.25 g. cm⁻³, 2.516 Å (B) 21.86 g. cm⁻³, 1.387 Å
 (C) 29.46 g. cm⁻³, 1.48 Å (D) None of these
20. Copper crystallises in a structure of face centred cubic unit cell. The atomic radius of copper is 1.28 Å. What is axial length on an edge of copper.
 (A) 2.16 Å (B) 3.63 Å (C) 3.94 Å (D) 4.15 Å
21. Metallic gold crystallises in fcc. lattice with edge-length 4.070 Å. Closest distance between gold atoms is:
 (A) 2.035 Å (B) 8.140 Å (C) 2.878 Å (D) 1.357 Å
22. Lead metal has a density of 11.34 g/cm³ and crystallizes in a face-centered lattice. Choose the correct alternatives
 (A) the volume of one unit cell is 1.214×10^{-22} cm³ (B) the volume of one unit cell is 1.214×10^{-19} cm³
 (C) the atomic radius of lead is 165 pm (D) the atomic radius of lead is 155.1 pm

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23. The co-ordination number of fcc structure for metals is 12, since
 (A) each atom touches 4 others in same layer, 3 in layer above and 3 in layer below
 (B) each atom touches 4 others in same layer, 4 in layer above and 4 in layer below
 (C) each atom touches 6 others in same layer, 6 in layer above and 6 in layer below
 (D) each atom touches 3 others in same layer, 6 in layer above and 6 in layer below
24. Aluminum metal has a density of 2.72g/cm^3 and crystallizes in a lattice with an edge of 404 pm. Which of the following alternatives are correct
 (A) it forms a base centered cubic unit cell (B) it forms a face centered cubic unit cell
 (C) its coordination number is 8 (D) its coordination number is 6
25. If the anions (A) form hexagonal closest packing and cations (C) occupy only $2/3$ octahedral voids in it, then the general formula of the compound is
 (A) CA (B) CA_2 (C) C_2A_3 (D) C_3A_2
26. In a multi layered close-packed structure
 (A) there are twice as many tetrahedral holes as there are close-packed atoms
 (B) there are as many tetrahedral holes as there are closed packed atoms
 (C) there are twice as many octahedral holes as there are close-packed atoms
 (D) there are as many tetrahedral holes as there are octahedral holes
27. In a compound, oxide ions are arranged in cubic close packing arrangement. Cations A occupy one-sixth of the tetrahedral voids and cations B occupy one-third of the octahedral voids. The formula of the compound is
 (A) A_2BO_3 (B) AB_2O_3 (C) $A_2B_2O_2$ (D) ABO_3
28. In the closest packing of atoms,
 (A) the size of tetrahedral void is greater than that of octahedral void
 (B) the size of tetrahedral void is smaller than that of octahedral void
 (C) the size of tetrahedral void is equal to that of octahedral void
 (D) the size of tetrahedral void may be greater or smaller or equal to that of octahedral void depending upon the size of atoms.
29. Correct statement for ccp is :
 (A) Each octahedral void is surrounded by 6 spheres and each sphere is surrounded by 6 octahedral voids
 (B) Each octahedral void is surrounded by 6 spheres and each sphere is surrounded by 6 octahedral voids
 (C) Each octahedral void is surrounded by 6 spheres and each sphere is surrounded by 8 octahedral voids
 (D) Each octahedral void is surrounded by 6 spheres and each sphere is surrounded by 12 octahedral voids
30. The empty space between the shared balls and hollow balls as shown in the diagram is called



- (A) hexagonal void (B) octahedral void (C) tetrahedral void (D) double triangular void

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