KJB SCIENCE SCHOOL

A PREMIER INSTITUTE OF EDUCATION

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TEST SERIES-{CHEMISTRY: XII} :-CHAPTER:- SOLID STATE {MM = 60} [set-A]

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Date – 07 -JANUARY-2014 {TUESDAY}

Q.1How would you distinguish between a metallic solid and an ionic solid other than by metallic luster?[1]
Q.2'Crystalline solids are anisotropic in nature'. What does this statement mean?[1]
Q.3 Name the non-stoichiometric point defect responsible for colour in alkalimetal halides.[1]
Q.4 How many atoms are there in one unit cell of a (i) body centered cubic crystal (ii)facecentered cubic crystal .[1]
Q.5What type of interactions holds the molecules together in a polar molecular solid?[1]
Q.6"Stability of a crystal is related to the magnitude of its melting point," How?[1]
Q.7What type of substances would make better permanent magnets, ferromagnetic or paramagnetic, why? [1]
Q.8An alloy of gold and cadmium crystallizes with a cubic structure in which gold atoms occupy thecorners and cadmium atoms fit into the face centers. Assign formula for this alloy.[2]
Q.9Explain how you can determine the atomic mass of an unknown metal if you know its mass, density and thedimensions and type of unit cell of its crystal?[2]
Q.10 (i)What is the coordination number of atoms?a) in fcc structure b) in bcc structure
(ii)How many lattice points are there in one cell of -a) fccb) bcc [2]
Q.11In terms of band theory, explain the difference between a conductor and a semiconductor and give onesuitable example for each. [2]
Q.12Find out the totalnumber of voids present in a Cubic closed structure .[2]
Q.13 Define the following terms in relation to crystalline solids. (i) Unit cell (ii) Coordination number . Give one example in each case. [2]
Q.14 Account for the following:
a) some of glass object recovered from ancient monuments look like milky instead of being transparent
b)Zinc oxide is white but turn yellow on heating. Explain [2]
Q.15Silver crystallizes in face-centered cubic unit cell. Each side of this unit cellhas a length of 400 pm. Calculate the radius of the silver atom. [2]
Q.16In a face centered cubic lattice atoms of A occupy corner of cell and that of B occupy face centers. One of the A atoms is missing from one corner of a unit cell. Find the simplest formula of compound.[2]
Q.17Ferric oxide crystallizes in a hexagonal closed pack array of oxide ions with two out of every three octahedral holes occupied by ferric ions. Deduce the formula of the ferric oxide.[2]
Q.18 Calculate is the percentage efficiency of packing in case of a body centered cubic lattice?[2]
Q.19Explain the following properties giving suitable examples.
(i) Ferromagnetism(ii) Para magnetism(iii) Ferrimagnetism [3]
Q.20 (i) What are *n*-type semiconductors? Name an element with which silicon should be doped to give *n*-type semiconductor.
(ii)How may the conductivity of an intrinsic semiconductor be increased?

(iii)Name an element with which silicon can be doped to give a *p*-type semiconductor. [3]

Q.21An element has a bcc structure with a cell edge of 288 pm. The densityof the metal is 7.2 g cm^{-3}. How many atoms and unit cells are there in208g of the element. [3]

Q.22 Aluminum crystallizes in a cubic closed packed structure. Its metallic radius is 125 pm.

[1] What is the length of the side of the unit cell ?[2] How many unit cells are there in one c.c of aluminium? [3]

Q.23 A solid has bcc structure. Distance of closest approach between two atoms is 1.73A^0. Find edge length of cell. [2]

Q.24 (i) What are voids? (ii) How a tetrahedral void is different from octahedral void?

(iii) Draw structure of tetrahedral and octahedral void. [3]

Q.25Find the type of lattice for cube having edge length of 400 pm, atomic wt. = 60 and density = 6.25 g/cc. [3]

Q.26Analysis shows that a metal oxide has empirical formula of $M_{0.90}O_1$ .calculate the percentage of M^{2+} and M^{3+} ion in the crystal. [3]

Q.27Give reasons for the following.(i) Schottky defect lowers the density of a solid.

(ii) Copper is conducting as such while copper sulphate is conducting only in molten state or in aqueoussolution.

(iii)Phosphorus doped silicon is a semiconductor. [3]

Q.28Iron has a body centered cubic unit cell with a cell edge of 286.65 pm. The density of iron is 7.874 g/cc.Use this information to calculate Avogadro's number. (At. mass of iron = 56 g/mol)[3]

Q.29(i) Identify the crystal systems which have the following crystallographic dimensions:

(i) a≠b ≠c, □ α = β =γ =90 (ii) a=b≠c α = β =90 γ =120

(ii)If cell edge is 280pm, what is the distance between K+ &Cl- ions if KCl exists in NaCl type?[3]