CHEMISTRY

NCERT - FULL MARKS

CHEMISTRY(TAMIL)

SOLID STATE - II

Example

1. Determine the number of formula units of NaCl in one unit cell. NaCl is face centred

cubic.

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2. Element 'A' and 'B' form a compound with cubic structure in which 'A' atoms are at the corners of the cube and 'B' atoms at the face centres. What is the formula of the compound ?

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Problems For Practice

1. The diffraction of crystal of Ba with X-ray of wavelength 2.29Å gives a first order reflection at $27^\circ 8'$. What is the distance between the diffracted patterns ?

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2. Diffraction angle 2θ equal to 14.8° for a crystal having interplanar distance in the crystal is 0.400 nm when second order

diffraction was observed. Calculate the wavelength of X-ray used.

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3. Find the interplanar distance in a crystal in which a series of planes produce a first order reflection from a copper X-ray tube $(\lambda = 1.542A^{\circ})$ at an angle of 23.2°.

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4. The X-ray of wavelength $1.5A^{\circ}$ are incident on a crystal having an interatomic distance of $1.6A^{\circ}$. Find out the angles at which the first and second order reflection take place.

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5. Calculate the angle at which (a) first order reflection and (b) second order reflection will occur in an X-ray spectrometer when X-ray of wavelength $1.54A^{\circ}$ are diffracted by the

atoms of a crystal, given that the interplanar distance is $4.04A^{\circ}$.

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Self Evaluation A Choose The Correct Answer

1. The number of chloride ions that surrounds the central Na^{+} ion in NaCl crystal is _____

A. 12

B. 8

C. 6

D. 4

Answer:

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2. The Bragg's equation is _____

A. $\lambda = 2d \sin\theta$

B. $nd = 2\lambda \sin\theta$

C. $2\lambda = nd\sin\theta$

D. $ny = 2d\sin\theta$

Answer:

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3. A regular three dimensional arrangement of identical points in space is called

A. Unit cell

B. Space lattice

C. Primitive

D. Crystallography

Answer:

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4. The smallest repeating unit in space lattice which when repeated over and again results in the crystal of the given substance is called

A. Space lattice

B. Crystal lattice

C. Unit cell

D. Isomorphism

Answer:

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5. The crystal structure of CsCl is _____

A. Simple cubic

B. face-centred cubic

C. Tetragonal

D. Body centred cubic

Answer:

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6. An example for Frenkel defect is _____

A. NaCl

B. AgBr

C. CsCl

D. FeS

Answer:

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7. Assertion (A): Metals have high thermal conductivity.

Reason (R): Due to thermal excitation of many electrons from the valence band to the

conductance band, metals have high thermal conductivity.

A. Super conductors

B. n-type semiconductors

C. p-type semiconductors

D. Insulators

Answer:

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8. In the Bragg's equation for diffraction of X-rays, 'n' represents

A. The number of moles

B. Avogadro number

C. A quantum number

D. Order of reflection

Answer:

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9. The number of close neighbours in a body centred cubic lattice of identifical spheres is

A. 6

B. 4

C. 12

D. 8

Answer:

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10. Graphite is a good conductor of electricity due to the presence of _____

A. Ionic crystals

B. Molecular crystals

C. Metallic crystals

D. Covalent crystals

Answer:

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11. In a simple cubic cell, each point on a corner is shared by

A. One unit cell

B. Two unit cell

C. 8 unit cell

D. 4 unit cell

Answer:

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12. The materials which conduct electricity at zero resistance are called ..... .

A. Semiconductor

B. Conductor

C. Superconductor

D. Insulator

Answer:

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13. The total number of atoms per unit cell is bcc is _____

A. 1

B. 2

C. 3

D. 4

Answer:

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14. Rutile is

A. TiO_2

B. Cu_2O

C. MoS_2

D. Ru

Answer:

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15. Pure semiconductors are called ..... .

A. rectifiers

B. transistors

C. solar cells

D. all the above

Answer:

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16. An example of metal deficiency defect

A. NaCl

B. AgCl

C. CsCl

D. FeS

Answer:

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Self Evaluation B Answer In One Or Two Sentences

1. Define the term : space lattice.

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2. State Bragg's law.

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3. The resistance of superconductors is ..... .

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4. Sketch the (a) simple cubic (b) face-centred cubic and (c) body centred cubic lattices.

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5. What is steady state ?

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6. Give two examples for metalloids.

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7. What is coordination number ?

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8. Write a note on the assignment of atoms per unit cell in body centred cubic lattic or CsCl.

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9. Write a short note on metallic crystals.

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10. How is sucrose formed?

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Self Evaluation C Answer Not Exceeding 60 Words

1. Derive de-Broglie's equation. What is its significance?

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2. Write the properties of ionic crystals.

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3. Explain Schottky defect.

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4. Define specific resistance electrical conductivity ? Give its unit.

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5. What is a rate determining step?

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6. Ordinary glass is

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