

CHEMISTRY STUDY MATERIALS FOR CLASS 12 (NCERT BASED QUESTIONS WITH ANSWERS)

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The Solid State

VERY SHORT ANSWER TYPE QUESTIONS (1 Mark)

Q. 1. What do you mean by paramagnetic substance?

Ans. Weakly attracted by magnetic field and these substances are made of atoms or ions with unpaired electrons.

Q. 2. Which substance exhibit both Schottky and Frenkel defects ?

Ans. AgBr.

Q. 3. Name a salt which is added to AgCl so as to produce cationic vacancies. Ans. CdCl₂

Q. 4. Why Frenkel defects not found in pure alkali metal halides?

Ans. Due to larger size of alkali metal ion, these cannot shift in interstitial space.

Q. 5. What is the use of amorphous silica?

Ans. Used in photovoltaic cell

Q. 6. Analysis shows that a metal oxide has the empirical formula M_{0.98}O_{1.00}. Calculate the percentage of M²⁺ and M³⁺ ions in the crystal.

Ans. Let the M²⁺ ion in the crystal be x and M³⁺ = 0.98 – x

Since, total charge on the compound must be zero,

$$\text{So, } 2x + 3(0.98 - x) - z = 0 \quad \text{Or } x = 0.94$$

$$\% \text{ of } M^{2+} = \frac{0.94}{0.98} \times 100 = 97.9\%$$

$$\% \text{ of } M^{3+} = 100 - 97.9 = 2.1\%$$

Q. 7. What is the co-ordination number of cation and anion in Cesium chloride (bcc arrangement) ?

Ans. 8 and 8.

Q. 8. What is F-centre?

Ans. It is the anion vacancy occupied by free electron in metal excess defect.

Q. 9. What makes alkali metal halides sometimes coloured, which are otherwise colourless ?

Ans. Due to presence of F-centre

Q 10. How does silica differ from quartz ?

Ans. Silica is amorphous form, while quartz is crystalline form of SiO_2 .

Q 11. Which point defect lowers the density of a crystal?

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Ans. Schottky defect/Vacancy defect.

Q 12. Why glass is called super cooled liquids?

Ans. *Hint* : Its molecules move under gravity.

Q 13. Some of the very old glass objects appear slightly milky instead of being transparent. Why?

Ans. Realignments of molecules takes place due to movement because of constant heating and cooling.

Q 14. What is anisotropy?

Ans. Physical properties show different values when measured along different axis in crystalline solids.

Q 15. What is the coordination number of atoms in :

(a) fcc structure (b) bcc structure ?

Ans. (a) 12 (b) 8

Q16. How many lattice points are there in one unit cell of :

(b) fcc

(c) bcc

(d) Simple cubic arrangement?

Ans. (a) 14 (b) 9 (c) 8

Q 17. What are the co-ordination numbers of octahedral voids and tetrahedral voids ?

Ans. 6 and 4 respectively.

Q 18. Why common salt is sometimes yellow instead of being pure white?

Ans. Due to the presence of electrons in some lattice sites in place of anions these sites act as F-centres. These electrons when excited impart colour to the crystal.

Q 19. A compound is formed by two elements X and Y. The element Y forms ccp arrangement and atoms of X occupy octahedral voids. What is the formula of the compound?

Ans. No. of Y (ccp) = 4

No. of X (octahedral void) = 4

X : Y = 4 : 4 Formula of the compound XY
