

SOLID STATE

1. What do you mean by paramagnetic substance?
2. Which substance exhibit Schottky and Frenkel both defects .
3. Why Frenkel defects not found in pure Alkali metal halide.
4. What is the use of amorphous silica?
5. What is the co-ordination no. of cation in Antifluorite structure?
6. What is anisotropy?
7. Explain how electrical neutrality is maintained in compounds showing Frenkel and Schottky defect ?
8. What type of substances would make better permanent magnets, ferromagnetic or ferrimagnetic, why?
9. What happens when:-
 - a. CsCl crystal is heated
 - b. Pressure is applied on NaCl crystal.
10. An element crystallizes in FCC structure; 200 g of this element has 4.12×10^{24} atoms. If the density of A is 7.2 g cm^{-3} , calculate the edge length of unit cell.
11. Niobium crystallizes in bcc structure. If its density is 8.55 g cm^{-3} , calculate atomic radius of Niobium. [At. Mass of Niobium = 92.9u, $N_A = 6.022 \times 10^{23} \text{ atoms mol}^{-1}$].
12. If radius of octahedral void is r and radius of atom in close packing is R , derive the relationship between r and R .
13. Non stoichiometric cuprous oxide can be prepared in the laboratory. In this oxide, copper to oxygen ratio is slightly less than 2:1 can you account for the fact that the substance is a p-type semiconductor?
14. The unit cell of an element of atomic mass 50 u has edge length 290pm. Calculate its density the element has bcc structure ($N_A = 6.022 \times 10^{23} \text{ atoms mol}^{-1}$).
15. Calculate the density of silver which crystallizes in face centered cubic form. The distance between nearest metal atoms is 287pm ($A_g = 107.87 \text{ g mol}^{-1}$, $N_A = 6.022 \times 10^{23}$).
16. What is the distance between Na^+ and Cl^- ions in NaCl crystal if its density 2.165 g cm^{-3} . NaCl crystallizes in FCC lattice.
17. Name a salt which is added to AgCl so as to produce cation vacancies.
18. What is F centre?
19. What makes Alkali metal halides sometimes coloured, which are otherwise colourless?
20. **How does amorphous silica differ from quartz?**
21. **Which point defect lowers the density of a crystal?**
22. **Why glass is called super cooled liquids**
23. **What is the coordination number of atoms?**
24. **Why common salt is sometimes yellow instead of being pure white?**
25. **A compound is formed by two elements X and Y. The element Y forms ccp and atoms of X occupy octahedral voids. What is formula of the compound .**

Gold crystallizes in an FCC unit cell. What is the length of a side of the cell ($r=0.144 \text{ nm}$)

ANS=0.407 nm .