

Question bank in Chemistry for practice: 2020-21
Class- XII : (Unit: 1, Solid state)

Dr. C SRINIVAS PGT Chemistry

01. Analysis show that FeO has a non-stoichiometric composition with formula $Fe_{0.95}O$. Give reason. Set-I,II,III CBSE-2018
02. Differentiate between **tetrahedral and octahedral voids**. Set-I,II,III- CBSE-2011
03. What do you understand by the terms **isotropy and anisotropy**. Set-I,II,III- CBSE-2011
04. Name a substance which on addition to AgCl causes cation vacancy in it.
05. What is meant by the term 'forbidden zone' in reference to band theory of solids? Set-I CBSE-2012(foreign)
06. What makes alkali metal halides sometimes coloured, which are otherwise colourless?
07. Write a short notes on the following terms
a). **Schottky defects** b). **Frenkel defects** c). **F-centres** d). **Anti-ferromagnetism**
08. **Write a short note on(mention examples at appropriate places)**
a). **Doping** b). **p-type of semiconductors** c). **n-type of semiconductors**.
09. What is co-ordination number. What is the co-ordination number of atoms in crystals with ccp(fcc) and bcc structures.
10. Which point defect in crystals does not alter the density of the relevant solid?
11. Silver forms a fcc lattice whose unit cell edge length is 409 pm. Calculate the density of silver. Molar mass of silver is 108 g/mol.
12. An element crystallizes in a structure having a fcc unit cell of an edge 200 pm. Calculate its density, if 200g of this element contains 24×10^{23} .
13. The length of the unit cell edge of a BCC metal crystal is 352 pm. Calculate the radius of an atom of the metal.
14. **If the radius of the octahedral void is r and radius of the atom in close packing is R, Derive the relation between r and R.**
15. Silver crystallizes in fcc unit cell. Each side of this unit cell has a length of 400 pm. Calculate the radius of the silver atom. (Assume the atoms just touch each other on the diagonal across the face of the unit cell. (That is each face atom is touching the four corner atoms.)
16. An element crystallizes in BCC. It has a density of 10 g/cm^3 at room temperature. Calculate the atomic radius of the element. (Atomic mass of the element = 60.23 g/mol & $N_A = 6.022 \times 10^{23}$).
17. The unit cell of an element of atomic mass 108 and density 10.5 g/cm^3 is a cube with edge length 409 pm. Find the structure of the crystal lattice. ($N_A = 6.022 \times 10^{23}$)
18. What is energy gap or forbidden zone. Explain the mechanism in case of conductors, insulators and semi conductors with the help of suitable diagrams.
19. Tungsten crystallizes in body centred cubic unit cell. If the edge of the unit cell is 316.5 pm, what is the radius of Tungsten atom? CBSE 2012
20. Iron has a body centred cubic unit cell with a cell dimension of 286.65 pm. The density of iron is 7.874 g/cm^3 . Use this information to calculate Avogadro's number (At. mass of Fe = 55.845u) CBSE 2012(Delhi set)
21. An element with density 11.2 gcm^{-3} forms a f.c.c. lattice with edge length of $4 \times 10^{-8} \text{ cm}$. Calculate the atomic mass of the element. (Given $N_A = 6.022 \times 10^{23}$) Set-I,II,III CBSE-2014
22. An element 'X' (At. Mass = 40 g/mol) having f.c.c. structure, has unit cell edge length 400 pm. Calculate the density of 'X' and the number of unit cells in 4 g of X. [$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$] Set-I,II,III CBSE-2018

Question bank in Chemistry for practice: 2020-21
Class - XII : (Unit: 2, Solutions)

01. Determine the value of Van't Hoff factor when Potassium ferricyanide dissociates by 50 percent.
02. Mention a large scale use of the phenomenon called reverse osmosis. **Set I,II,III CBSE-2009**
03. State Henry's law. What is the effect of temperature on the solubility of a gas in a liquid.
Set-I,II,III CBSE-2014
04. Two liquid A and B boil at 145 °C and 190°C respectively. Which of them has a higher vapour pressure at 80 °C ?
Set I,II,III CBSE-2008
05. Explain : a). positive deviations and b). negative deviations by taking example in each case and show the graphical representations.
06. How is molality of a solution different from its molarity ? What is the effect of change in temperature of a solution on its molality and molarity ?
Set-I, III CBSE-2010
07. Define Raoult's law in terms of a). Mole fraction of solvent b). Mole fraction of solute c). For two or more miscible volatile liquids d). as a special case of Henry's law.
08. What are ideal and non-ideal solutions. Write characteristics in terms of ΔH and ΔV .
09. What do you understand by a). Azeotropes b). Colligative properties c). Van't Hoff factor
10. Calculate the boiling point of a solution prepared by adding 15g. of NaCl to 250g. of Water. ($K_b = 0.512\text{K mol}^{-1}$ and molar mass of NaCl is 58.5 g/mol)
11. Calculate the freezing point of a solution containing 60 g. of glucose[Molar mass = 180 g/mol] in 250 g of water. **K_f for water is 1.86 K kg mol⁻¹.**
Set-I,II,III CBSE-2018
12. (a). Urea forms an ideal solution in water. Determine the vapour pressure of an aqueous solution containing 10% by mass of urea at 40°C. [Vapour pressure of water at 40°C = 55.3mm of Hg]
(b). Why is freezing point depression of 0.1M sodium chloride solution nearly twice that of 0.1M glucose solution ?
13. A 0.1539 molar aqueous solution of cane sugar (molar mass=342 g/mol) has a freezing point 271k while the freezing point of pure water is 273.15k. What will be the freezing point of an aqueous solution containing 5g. of glucose. (Molar mass = 180 g/mol) per 100 of solution.
14. Calculate the temperature at which a solution containing 54g of glucose[C₆H₁₂O₆] in 250 g of water will freeze. (K_f for water = 1.86 K/mol)
15. 100 mg of a protein is dissolved in just enough water to make 10.0 ml of solution. If this solution has an osmotic pressure of 13.3 mm of Hg at 25°C. What is the molar mass of the protein ? ($R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$ and 760 mm Hg = 1 atm)
16. Calculate the freezing point depression expected for 0.0711 m aqueous solution of Na₂SO₄. If this actually freezes at -0.320 °C, what would be the value of Van't Hoff factor ? ($K_f = 1.86 \text{ K mol}^{-1}$).
17. Calculate the osmotic pressure of a decimolar solution of sugar at 25°C. ($R = 0.0821 \text{ L.A.K}^{-1} \text{ mol}^{-1}$).
18. A 1.00 molar aqueous solution of trichloroacetic acid(CCl₃COOH) is heated to its boiling point. The solution has the boiling point of 100.18°C. Determine the Van't Hoff factor for trichloroacetic acid. (K_b for water = 0.512K kg mol⁻¹)
19. 18g. of glucose[C₆H₁₂O₆] is dissolved in 1 kg of water in a spacecup. At what temperature will water boil at 1.013bar ? (K_b for water is 0.52k/mol)
20. Calculate the mass of compound(molar mass=250g/mol) to be dissolved in 75g. of benzene to lower its freezing point by 0.48K($K_f = 5.12 \text{ kg/mol}$)
21. (a). Measurement of Osmotic pressure method is preferred for the determination of molar masses of macromolecules such as proteins and polymers.
(b). aquatic animals are more comfortable in cold water than in warm water.
(c). Elevation of boiling point of 1M KCl solution is nearly double than that of 1M sugar solution.
Set-I,II,III CBSE-2018