

KCET (CHEMISTRY) TOPIC : SOLIDS

1. Among the solids, the lowest melting point is exhibited by

- 1) covalent solids **2) molecular solids** 3) ionic solids 4) amorphous solids

2. Which of the following shows good electrical conduction?

- 1) pure common salt 2) sand **3) a gold ring** 4) ice

3. Anisotropy is observed in case of

- 1) plastic 2) sand 3) rubber **4) common salt**

4. The crystal system of a compound with unit cell dimensions $a = 0.39$, $b = 0.39$ and $c = 0.65$ nm and $\alpha = \beta = \gamma = 90^\circ$ is

- 1) cubic 2) orthorhombic **3) tetragonal** 4) triclinic

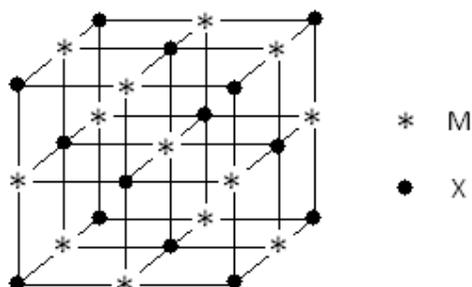
5. The number of Bravais lattices are

- 1) 7 types 2) 10 types **3) 14 types** 4) 21 types

6. Na and Mg crystallise in *bcc* and *fcc* type crystals respectively. The number of atoms of Na and Mg present in their unit cells is

- and 2 2) 9 and 14 3) 14 and 9 **4) 2 and 4**

7. A compound M_pX_q has cubic close packing arrangement of X. Its unit cell is shown below.



The formula of the compound is

- 1) MX** 2) M_2X_3 3) M_2X 4) $M_{13}X_{14}$

8. The free space in *ccp* and *bcc* structures is about

- 1) 48 % and 26 % 2) 30 % and 26 % **3) 26 % and 32 %** 4) 32 % and 48 %

9. Number of tetrahedral voids in NaCl unit cell is

- 1) 2 2) 4 3) 6 **4) 8**

10. Atoms of element Y form the *ccp* lattice in a compound and those of element X occupy $2/3^{\text{rd}}$ of tetrahedral voids. The formula of the compound would be

- 1) X_3Y_4 **2) X_4Y_3** 3) X_2Y_3 4) X_2Y

11. Between the first two layers of A and B in *hcp* and *ccp* structures

- 1) only tetrahedral voids are covered**
2) only octahedral voids are covered
3) both tetrahedral and octahedral voids are covered
4) both tetrahedral and octahedral voids are not covered

12. Which of the following defects lowers the density of crystal?

- 1) Frenkel 2) Schottky 3) presence of F – centres 4) interstitial

13. Lead sulphide is isostructural with NaCl. The shortest distance between Pb^{+2} and S^{-2} ions is 297 pm. What is the volume of unit cell of lead sulphide ?

- 1) $209.6 \times 10^{-24} \text{ cm}^3$ 2) $26.2 \times 10^{-24} \text{ cm}^3$ 3) $52.4 \times 10^{-24} \text{ cm}^3$ 4) $104.8 \times 10^{-24} \text{ cm}^3$

14. For a cubic crystal face diagonal is 3.50 \AA . Its face length is

- 1) 1.750 \AA 2) 2.475 \AA 3) 2.021 \AA 4) 3.50 \AA

15. The radius ratio that provides the co – ordination number 6 for a particle in a crystalline solid is

- 1) 0.24 2) 0.36 3) 0.51 4) 0.93

16. Which of the following electron spin arrangements in magnetic domains represents magnetic moments of antiferromagnetic substances?

- 1) $\uparrow\uparrow\uparrow\uparrow\uparrow\uparrow$ 2) $\downarrow\downarrow\downarrow\downarrow\downarrow\downarrow$
 3) $\uparrow\uparrow\downarrow\uparrow\uparrow\downarrow$ 4) $\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow$

17. Frenkel defect is produced due to

- 1) missing of one positive ion and one negative ion from the crystal lattice
 2) displacement of a positive ion from its proper position to an interstitial site
 3) missing of a negative ion from crystal lattice and the hole is being occupied by an electron
 4) missing of a positive ion from crystal lattice and its charge being balanced by adjacent metal ion having two charges instead of one

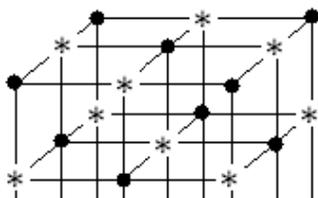
18. Excess of potassium of ions makes KCl crystals appear violet in colour since

- 1) some of the anionic sites are occupied by an unpaired electron
 2) some of the anionic sites are occupied by a pair electrons
 3) there are vacancies at some anionic sites
 4) F - centres are created at cationic sites which impart the colour

19. Doping of silicon with P or Al can increase the semiconductor property. The difference in two cases is

- 1) P is a non metal while Al is a metal
 2) P is a poor conductor and Al is a conductor
 3) P gives rise to extra electrons and Al gives rise to holes
 4) P gives rise to holes and Al gives rise to extra electrons

20. For a solid with unit cell,



the co-ordination number of the particle B is

- 1) 4 2) 8 3) 12 4) 6

8. An azeotropic solution having two liquid components with boiling point less than either of the pure components is expected to

- a) be an ideal solution
- b) be a non ideal solution showing -ve deviation
- c) be a non ideal solution showing +ve deviation**
- d) undergo fractional distillation

9. A liquid mixture contains 138 gm of ethyl alcohol and 72 g of water. The ratio of mole fraction of alcohol to water is

- a) 3 : 4**
- b) 1 : 2
- c) 1 : 4
- d) 1 : 1

10. The vapour pressure of benzene at a certain temp is 640 mm Hg. A non-volatile, non-electrolyte solute weighing 2.175 g is added to 39.0 g of benzene the vapour pressure of the solution changes to 600 mm Hg. The molecular weight of the solid substance is

- a) 69.6**
- b) 65.3
- c) 63.8
- d) 75.5

11. K_f for water is $1.86 \text{ K kg mol}^{-1}$. How many grams of ethylene glycol ($\text{C}_2\text{H}_6\text{O}_2$) must be added to 1 kg water, to get the freezing point of the solution lowered to -2.8°C ?

- a) 27
- b) 72
- c) 93**
- d) 39

12. When 20 gm of an acid ($\text{C}_{11}\text{H}_8\text{O}_2$) is dissolved in 50 gm benzene ($K_f = 1.72 \text{ K kg mol}^{-1}$) a freezing point depression of 2K is observed. The van't Hoff's factor is

- a) 0.5**
- b) 1.0
- c) 2.0
- d) 3.0

KCET CHEMISTRY TOPIC – SURFACE CHEMISTRY

1. In the removal of poisonous carbon monoxide to make the air safe for breathing activated charcoal is used as

- a) absorbent
- b) adsorbent**
- c) absorbate
- d) adsorbate

2. Which of the following statements is incorrect about physisorption ?

- a) it occurs because of van der Waals forces
- b) more easily liquefiable gases are more easily adsorbed
- c) it produces multimolecular layer on adsorbent surface
- d) enthalpy of adsorption is less and positive**

3. For adsorption in general

- a) ΔH is +ve, ΔS is -ve and ΔG is -ve
- b) ΔH is -ve, ΔS is -ve and ΔG is -ve
- c) ΔH is +ve, ΔS is -ve and ΔG is +ve
- d) ΔH is -ve, ΔS is -ve and ΔG is +ve**

4. Which of the following is an example of homogeneous catalysis?

- a) hydrogenation of oils
- b) synthesis of ammonia by Haber's process
- c) manufacture of sulphuric acid by chamber process**
- d) manufacture of sulphuric acid by contact process

5. Shape selective catalysts are called so because of

- a) the shape of catalysts
- b) the high specificity of catalysts
- c) the size of pores of catalyst which can trap only the selective molecules**
- d) their use for only some selected reactions

6. Zeta potential (or electro kinetic potential) is
- potential required to cause coagulation
 - potential required to provide the speed of 1cm/sec speed for colloidal particles
 - potential difference between fixed charged layer and the diffused layer of opposite charge
 - potential energy of the colloidal particles

7. Which of the following colloids cannot be coagulated easily?
- colloidal sulphur
 - colloidal starch
 - colloidal silver
 - colloidal ferric hydroxide

8. A colloidal solution moves towards anode under the electric field. The most effective electrolyte for the coagulation of this colloid is
- Na_2SO_4
 - BaCl_2
 - AlCl_3
 - BaSO_4

9. Match the following

Column I	Column II
A. dialysis	P. coagulation
B. peptisation	Q. cleansing action of soap
C. emulsification	R. formation of sol
D. electrophoresis	S. purification

- A - Q, B - R, C - S, D - P
- A - S, B - R, C - Q, D - P
- A - R, B - P, C - S, D - Q
- A - P, B - R, C - Q, D - S

10. The CMC of a given soap in water is $10^{-3} \text{ molL}^{-1}$. A $10^{-4} \text{ molL}^{-1}$ solution of this soap in water is a
- lyophilic sol
 - lyophobic sol
 - associated colloid
 - true solution

11. Micelles are
- ideal solutions
 - associated colloids
 - lyophobic sols
 - emulsion cum gel colloids

12. An emulsifier is an agent which
- accelerates the dispersion
 - homogenises the emulsion
 - stabilises the emulsion
 - aids the flocculation of an emulsion

13. Cleansing action of soap occurs because
- oily matter is absorbed into the hydrophobic centres of soap micelles and washed away
 - oily matter is absorbed into the hydrophilic centres of soap micelles and washed away
 - oily matter is absorbed into both hydrophobic and hydrophilic centres but not washed away
 - cleansing action is not related to micelles

14. Gold number is a measure of the amount of gold
- present in the colloidal solution
 - required to break the colloid
 - required to protect the colloid
 - index of protective power of lyophilic sol