PAPER CODE : 6006

M.Sc. Semester – 3
JULY-SEP-2021
Chemistry: Paper - CHNN – 601 (P)
[Physical Chemistry]

કુલ સમય :– ૬૦ મીનીટ કુલ પ્રશ્નો : ૫૦ વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૩૫

નોંધ : વિદ્યાર્થીએ માત્ર ૩૫ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૩૫ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

Q-1) Adsorption is multilayering the case of.
a) Physisorption b.Chemisorption c.Both d.None of both

Q-2) At the equilibrium position in the process of adsorption.
a) $\Delta H > 0$ b.$\Delta H = T\Delta S$ c.$\Delta H > T\Delta S$ $d.\ \Delta H < T\Delta S$

Q-3) How many Cl^- ions are surrounding Na^+ ions in NaCl crystal.
a) 4 b.6 c.8 d.12

Q-4) Edge length of unit cell is 287 pm with bcc. The atomic radius is _____ pm.
a) 287 b.574 c.124.27 d.143.5

Q-5) What is Gibbs phase rule for metallurgical system?
a) F = C – 1 – P b.F = C – 2 – P c.F = C + 2 + P d.F = C + 1 – P

Q-6) Number of degree of freedom at a triple point in unary phase diagram is?
a) 0 b.1 c.-1 d.10

Q-7) Photochemical smog normally does not contain.
a) Chlorofluoro carbons b.Peroxyacetyl nitrate c.zone d.Acrolein

Q-8) Depletion of the ozone layer is caused due yo.
a) Ferrocene b.Fullerenes c.Freons d.Polyhalogens

Q-9) Which of the following will show Tyndall effect?
a) Aqueous solution of soap below critical micelle concentration.
b) Aqueous solution of soap above critical micelle concentration.
c) Aqueous solution of NaCl. D.Aqueous solution of sugar.

Q-10) _____ enzyme convert maltose in to glucose.
a) Zymase b.Invertase c.Maltase d.All of These

Q-11) The coordination number of atoms in a body-central cubic structure is _____ .
a) 4 b.6 c.8 d.12

Q-12) What causes crystal grouth?
a) Vapor b.Solute c.Melt d.Vapor, Solution and Melt.

Q-13) For water system, the number of phases at the triple point is _____ .
a) 0 b.1 c.2 d.3

Q-14) Liquid phase exists for all composition above _____ region.
a) Isometric region. B.Sublimation region. C.Eutectic region. D.Equilibrium region.

Q-15) The efficiency of solar cell is about.
a) 15 % b.25 % c.40 % d.60 %

Q-16) The function of a solar collector is to convert _____ .
a) Solar energy in to electricity. B.Solar energy in to thermal energy.
b) Solar energy in to radiation. D.Solar energy in to mechanical energy.

Q-17) _____ force is involed in physicosorpasan?
a) Gravitational b.Magnetic c.Van der waals d.Electromagnetic

Q-18) Which of the following process dose not occur at the interface of phases?
a) Crystallization b.Homogeneous catalysis c.Heterogeneous catalysis d.Corrosion

Q-19) The fraction of the total volume occupied by the atoms present in a simple cube is.
a) $\frac{\pi}{4}$ b.$\frac{\pi}{6}$ c.$\frac{\pi}{3\sqrt{2}}$ d.$\frac{\pi}{4\sqrt{2}}$

Q-20) The edge length of fcc cell is 508 pm. If radius of cation is 110 pm.What is the redius of anion?
a) 110 pm b.574 pm c.124.27 pm d.143.53 pm

Q-21) Which is the Gibbs phase rule for general system.
a) P + F = C – 1 b.P + F = C + 1 c.P + F = C – 2 d.P + F = C +2

Q-22) Which is degree of freedom when two phases co-exist?
a) 0 b.1 c.2 d.3

Q-23) _____ is photochemical reaction.
a) Photosynthesis b.Decomposition of ammonia c.Formation of NaOH d.Decomposition of HCl

Q-24) Ozone is formed by _____ Dissociation of molecular.
a) Ionic b.Thermal c.Photochemical d.Thermochemical

Q-25) The formation of micells takes place only above,

a) Inversion temperature b.Boyle's temperature

b) Critical temperature d.Kraft temperature

Q-26) What is the unit of surface excess?

a) $Mol \cdot M^{-2}$ b.$M^{2} \cdot Mol^{-1}$ c.$M^{2} \cdot Kg^{-1}$ d.$Mol \cdot Kg^{-1}$

Q-27) For the formation of $ZnFe_2O_4$ spinal which method can be used in order of achieve high degree of homogenization?

a) Distillation method b.Vaporization method

b) Coprecipitation method d.Crystallization method

Q-28) What is the major important factors for the solid state reactions?

a) Size of the particles b.Mechanical properties of solids

b) Thermodynamic and kinetic factors d.Environmental factors

Q-29) Density is 2.165 gm cm^{-3} of NaCl. What is the distance of Na^{+} and Cl^{-}?

a) 564 pm b.282 pm c.234 pm d.538 pm

Q-30) _____ have metal deficiency defect?

a) NaCl b.FeO c.KBr d.ZnO

Q-31) In which equilibria, in which either P and T can be changed independently?

a) Univariant b.Invariant c.Bivariant d.All of the above

Q-32) For binary phase diagram Gibbs phase rule may be given as _____ .

a) F = c + P + 2 b.F = c - P + 2 c.F = c + P – 1 d.F = c - P + 1

Q-33) The reaction which are caused by heat and in absence of light is called _____ .

a) Photochemical reaction b.Reversible reaction

b) Reversible Photochemical reaction d.Dark reaction

Q-34) In photochemical reactions, absorption of _____ radiations takes place.

a) Only visible b.Only Ultraviolate c.Visible and ultraviolate d.Visible and X Rays

Q-35) Nitrogen fixation is the conversion of _____ .

a) N_2 and N b.N_2 and NH_3 c.N_2 and NO_3^- d.N_2 and urea

Q-36) The value of solar constant is _____ .

a) 1367 w/m^2 b.1357 w/m^2 c.1347 w/m^2 d.1377 w/m^2

Q-37) _____ example of sorption.

a) Sponge in water b.Water in silica gel c.Oxygen on metal surface d.Cotton dipped in ink

Q-38) _____ statement is not true with respect to chemisorption.

a) Depends on nature of adsorbate and adsorbent. B.Has a large heat of adsorption.

b) Occurs at low temperature. D.Forms a unimolecular layer.

Q-39) Alkali halides do not show Frenkel defect because,

a) Cations and anions have large deference in size. B.Cations and anions have almost equal size.

b) Cations and anions have low coordination number. D.Anion cannot be accommodated in voids.

Q-40.Edge length of bcc lattice unit cell is 300 pm and molar mass is 50 gm/mol. What is the density of a metal?

c) 6.15 gm/cm^3 b.9.32 gm/cm^3 c.10.3 gm/cm^3 d.14.2 gm/cm^3

Q-40) Which crystal growth is fastest?

a) Sea salt b.Table salt c.Ferrossulphate salt d.Epsom salt

Q-41) What is the advantage of using Czochralski, Bridgman-Stockbarger and Verneuil method?

a) Gives small crystals b.High tech apparatus c.Rapid growth rates d.Uses plasma torch

Q-42) The degree of freedom at a triple point in the unary diagram for water is _____ .

a) 3 b.2 c.1 d.0

Q-43) Select a non-homogeneous system from the following.

a) Saturated solution of NaCl. B.Suger solution. C.Glucose solution. D.Salt solution.

Q-44) Calculate the eutectic concentration given the following data. pressure = 1 atm and temperature = 1^0C.

a) 0 b.1 c.2 d.3

Q-45) What is the process called when the molecules of a substance are retained at the surface of a solid or a liquid.

a) Sorption b.Desorption c.Absorption d.Adsorption

Q-46) Which one of the following is not applicable to the phenomenon of adsorption?

a) $\Delta H > 0$ b.$\Delta H < 0$ c.$\Delta H = 0$ d.$\Delta G < 0$

Q-47) At high concentration of soap in water, soap behaves as _____ .

a) Molecular colloid b.Lyophilic colloid c.Associated colloid d.Lyophobic colloid

Q-48) What is the purpose of seed crystal in crystal growth?

a) Catalyst b.Nucleation center c.Solvent d.Solution

Q-49) What happens when a crystal grows in size?

a) It becomes softer b.It becomes rough c.It becomes coarsely d.It becomes smoother