CHEMISTRY

BOOKS - FULL MARKS CHEMISTRY (TAMIL ENGLISH)

SAMPLE PAPER -07

Part I

1. An element X has the following isotopic composition

$200X = 90\%$, $199X = 85\%$ and $202X = 2\%$

The weighted average atomic mass of the element X is closest to _____

A. 201u

B. 202 u

C. 199 u

D. 200 u

Answer: d

▶ View Text Solution

2. Which of the following is not used in writing electronic configuration of an atom?

A. Aufbau principle

B. Hund's rule

C. Pauli's exclusion principle

D. Heisenberg's uncertainty principle

Answer: d

▶ **View Text Solution**

3. Assertion (A): Cr with electronic configuration $[Ar]3d^5\,4s^1$ is more stable than (Ar) $3d^44s^{2s}$

Reason (R): Half filled orbitals have been found to have extra stability than partially filled orbitals

   A. A and R are correct and R is the correct explanation of A

   B. A and R are correct but R is not the correct explanation of A

C. A is correct but R is wrong.

D. A is wrong but R is correct

Answer: a

▶ **View Text Solution**

4. Which of the following is the correct expression for the equation of state of van der Waals gas?

A. $\left(P + \dfrac{a}{n^2V^2}\right)(V - nb) = nRT$

B. $\left(P + \dfrac{a}{n^2 V^2}\right)(V - nb) = nRT$

C. $\left(P + \dfrac{(an)^2}{V^2}\right)(V - nb) = nRT$

D. $\left(P + \dfrac{N^2 a^2}{V^2}\right)(V - nb) = nRT$

Answer: c

▶ **View Text Solution**

5. In a reversible process, the change in entropy of the universe is_____

A. > 0

B. > 0

C. < 0

D. $= 0$

Answer: d

▶ **View Text Solution**

6. Which of the following is not a general characteristic of equilibrium involving physical process?

A. Equilibrium is possible only in a closed system at a given temperature

B. The opposing processes occur at the same rate and there is a dynamic but stable condition

C. All the physical processes stop at equilibrium

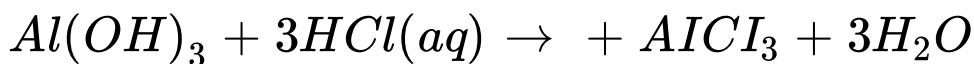D. All measurable properties of the system remains constant

Answer: c

7. Stomach acid, a dilute solution of HCl can be neutralised by reaction with Aluminium hydroxide

$$Al(OH)_3 + 3HCl(aq) \rightarrow\ + AICI_3 + 3H_2O$$

How many millilitres of 0.1 $MAl(OH)_3$ solution are needed to neutralise 21 mL of 0.1 M HCl?

A. 14 mL

B. 7 ml

C. 21 mL

D. none of these

Answer: b

▶ **View Text Solution**

8. Shape and hybridisation of IF_5 are_____

A. Trigonal bipyramidal, $sp^3 d^2$

B. Trigonal bipyramidal, $sp^3 d$

C. Square pyramidal, $sp^3 d^2$

D. Octahedral, sp^3d^2

Answer: c

▶ **View Text Solution**

9. Consider the following statements:

It is not possible for the carbon to form either

C^{4-} (or) C^{4-}

(ii) Carbon can form ionic bonds.

(iii) In compounds of carbon, it form covalent

bonds.

Which of the above statement is//are not correct?

A. (i) and (ii)

B. (iii) only.

C. (i) only

D. (ii) only

Answer: d

▶ **View Text Solution**

10. Which of the following compound used for metal cleaning solvent?

    A. Methylene chloride

    B. Methyl chloride

    C. Chloroform

    D. Ethane

Answer: a

▶ **View Text Solution**

11. The number of possible isomers of CH_6H_{12}

, is _____

    A. 2

    B. 3

    C. 5

    D. 6

Answer: c

▶ View Text Solution

12. Ozone layer is depleted by the reactive_____

    A. Hydrogen atom

    B. Oxygen atom

    C. Fluorine atom

    D. Chlorine atom

Answer: d

▶ **View Text Solution**

1. Calculate the average atomic mass of naturally occurring magnesium using the following data.

▶ View Text Solution

2. What are quantum numbers?

▶ View Text Solution

3. How 2-cthylanthraquinone helps to prepare hydrogen peroxide?

▶ View Text Solution

4. Calculate the pressure exerted by 2 moles of sulphur hexafluoride in a steel vessel of volume $6dm^3$ at $70°C$ assuming it is an ideal gas.

▶ View Text Solution

5. What are the important features of lattice enthalpy?

▶ **View Text Solution**

6. What are aqueous and non-aqueous solution? Give example.

▶ **View Text Solution**

7. What is bond enthalpy? How they relate with bond strength?

> ▶ View Text Solution

8. What is triad system? Give example.

> ▶ View Text Solution

9. What is stone leprosy? How is it formed?

> ▶ View Text Solution

1. Calculate the equivalent mass of hydrated ferrous sulphate.

▶ **View Text Solution**

2. Calculate the uncertainty in position of an electron, if

$\Delta v = 0.1\%$ and $v = 2.2 \times 10^6 ms^{-1}$
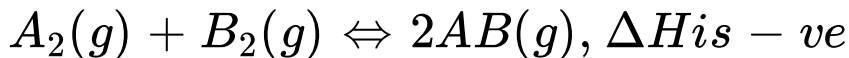
3. Distinguish between diffusion and effusion

4. For a chemical reaction the values of ΔH and ΔS at $300K$ are $-10 kJmol^{-1}$ and $-203K^{-1}mol^{-1}$ respectively. What is the value of ΔG of the reaction? Calculate the ΔG of a ran. at 600K assuming ΔH and ΔS

values are constant$\Delta H$and ΔS values are constant. Predict the nature of the reaction.

5. For the reaction:

$$A_2(g) + B_2(g) \Leftrightarrow 2AB(g), \Delta His - ve$$

The following molecular scenes represent different reaction mixture (A - light grey B - dark grey)

(1) Calculate the equilibrium constant K, and K.

(ii) For the reaction mixture represented by

scene (x), (y) the reaction proceed in whichdirections?

(iii) What is the effect of increase in pressure for the mixture at equilibrium?

▶ View Text Solution

6. Derive the relationship between the relative lowering of vapour pressure and mole fraction of the solute

▶ View Text Solution

7. Differentiate between the principle of estimation of nitrogen in an organic compound by (l):Dumas method

(ii) Kjeldahl's method

▶ View Text Solution

8. In what way free radical affect the human body?

▶ View Text Solution

9. Dissolved oxygen in water is responsible for aquatic life. What processes are responsible for the reduction in dissolved oxygen in water?

▶ **View Text Solution**

Part Iv

1. Calculate the equivalent mass of sulphuric acid

(ii) The reaction between aluminium and ferric oxide can generate temperatures up to 3273 K and is used in welding metals.

(Atomic mass of Al= 27 u Atomic mass of O = 16 u) $2Al + Fe_2O_3 \rightarrow AI_2O_3 + 2Fe,$ If, in this process, 324 g of aluminium is allowed to react with 1.12 kg of ferric oxide. (a) Calculate the mass of AI_2O_3 formed

(b) How much of the excess reagent is left at the end of the reaction?

2. Consider the following electronic arrangements for the d' configuration. (2)

1. Which of these represents the ground state?

2. Which configuration has the maximum exchange energy? (ii) An ion with mass number 56 contains 3 units of positive charge and 30.4% more neutrons than electrons. Assign symbol to the ion
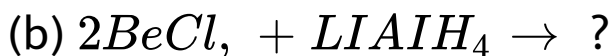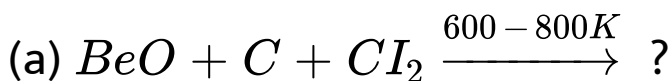
3. State the Newland's law of octaves.

(i) What are the two exceptions of block division in the periodic table?

4. Complete the following reactions

(a) $BeO + C + CI_2 \xrightarrow{600-800K}$?

(b) $2BeCl, + LIAIH_4 \rightarrow$?

(ii) What happens when quick lime reacts with

(a) H_2O and(b) CO_2?

5. State the first law of thermodynamics

(ii) Calculate the enthalpy of combustion of ethylene at 300 K, at constant pressure, If its heat of combustion at constant volume (AU) is -1406 kJ.

6. Explain how the equilibrium constant K_c predict the extent of a ronction

(ii) Explain about the effect of catalyst in an equilibrium reaction?

7. Briefly explain geometrical isomerism in alkenes by considering 2- butene as an example

2-butene: Geometrical isomerism:

(ii) What is meant by condensed structure? Explain with an example

8. (i) Why cut apple turns a brown colour?

(ii) Predict the product for the following reaction,

9. Suggest the route for the preparation of the following from benzene.

1.3-chloro-nitrobenzene   2. 4-chlorotoluene

3. Bromobenzene   4. m - dinitrobenzene

10. A hydrocarbon C,H, (A) reacts wit A reacts with HBr to form compound (B). Compound (B) rencts with aqueous potassium hydroxide to give (C) of molecular formula C_3H_6O to give (C) of molecular formula C.H.O. What are (A) Ans. (B) and (C). Explain the reactions