



CHEMISTRY

BOOKS - FULL MARKS CHEMISTRY (TAMIL ENGLISH)

SAMPLE PAPER-8

Part I

1. 40 ml of methane is completely burnt using 80 ml of oxygen at room temperature. The volume of gas left after cooling to room temperature is

A. 40 ml CO_2 gas

B. 40 ml CO_2 gas and 80 ml H_2O gas

C. 60 ml CO_2 gas and 60 ml H_2O gas

D. 120 ml CO_2 gas

Answer: A



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2. What are the values of n , l , m and s for $3p_x$ electron ?

A. 3,2,1,0

B. 3, 1, -1 , $+\frac{1}{2}$

C. 3, 2, $+1$, $-\frac{1}{2}$

D. 3, 0, 0, $+\frac{1}{2}$

Answer: B



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3. Which of the following statements is incorrect in relation to ionization enthalpy ?

A. Ionization enthalpy increases for each successive electron

B. The greatest increase in ionization enthalpy is experienced on removal of electrons from core noble gas configuration.

C. End of valence electrons is marked by a big jump in ionization enthalpy.

D. Removal of electron from orbitals bearing lower n value is easier than from orbital having high n value.

Answer: D



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4. Lithium shows diagonal relationship with

A. sodium

B. magnesium

C. calcium

D. aluminium

Answer: B



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5. The variation of volume V , with temperature T , keep pressure constant is called the coefficient of thermal expansion ie

$$\alpha = \frac{1}{V} \left(\frac{\partial V}{\partial T} \right)_P. \text{ For an ideal gas } \alpha \text{ is equal to}$$

A. T

B. $1/T$

C. P

D. none of these

Answer: B



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6. Heat of combustion is always

- A. Positive
- B. Negative
- C. Zero
- D. Either positive or negative

Answer: B

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7. If in a mixture where $Q = K$, then what happens?

- A. the reaction shift towards products
- B. the reaction shift towards reactants
- C. nothing appears to happen, but forward and reverse reactions are continuing at the same rate

D. nothing happens

Answer: C

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8. Which one of the following gases has the lowest value of Henry's Law constant.

A. N_2

B. He

C. CO_2

D. H_2

Answer: C

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9. In the molecule $O_A = C = O_B$, the formal charge on O_A , C and O_B are respectively.

A. $-1, 0, +1$

B. $+1, 0, -1$

C. $-2, 0, +2$

D. $0, 0, 0$

Answer: D



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10. In the hydrocarbon

$CH_3 - CH_2 - CH = \cdot CH - CH_2 - C \equiv CH$ the state of

hybridisation of carbon 1,2,3,4 and 7 are in the following sequence.

A. sp , sp , sp^3 , sp^2 , sp^3

B. sp^2 , sp , sp^3 , sp^2 , sp^3

C. sp , sp , sp^2 , sp , sp^3

D. none of these

Answer: A

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11. Enzyme present in apple is

A. Polyphenol oxidase

B. Polyphenol reductase

C. Polyphenol

D. Polyphenol hydrolase

Answer: A



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12. The correct statement regarding the comparison of staggered and eclipsed conformations of ethane is

A. the eclipsed conformation of ethane is more stable than staggered conformation even though staggered conformation has torsional strain.

B. the staggered conformation of ethane is more stable than eclipsed conformation, because staggered

conformation has no torsional strain.

C. the staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has torsional strain.

D. the staggered conformation of ethane is less stable than eclipsed conformation, because staggered conformation has no torsional strain.

Answer: B



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13. In Frankelstein reaction, the mechanism followed is

A. S_N1

B. E_1

C. E_2

D. S_N2

Answer: D



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14. Which sequence for greenhouse gases is based on GWP?

A. $CFC > N_2O > CO_2 > CH_4$

B. $CFC > CO_2 > N_2O > CH_4$

C. $CFC > N_2O > CH_4 > CO_2$

D. $CFC > CH_4 > N_2O > CO_2$

Answer: C



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Part II

1. Define Avogadro Number.



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2. Explain the meaning of the symbol $4f^2$. Write all the four quantum numbers for these electrons.



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3. Is the definition given below for ionization enthalpy is correct?

"Ionization enthalpy is defined as the energy required to remove the most loosely bound electron from the valence shell of an atom"

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4. What are the uses of calcium hydroxide?

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5. 30.4 KJ is required to melt one mole of sodium chloride. The entropy change during melting is $28.4JK^{-1}mol^{-1}$. Calculate the melting point of sodium chloride.

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6. How is a gas-solution equilibrium exist?

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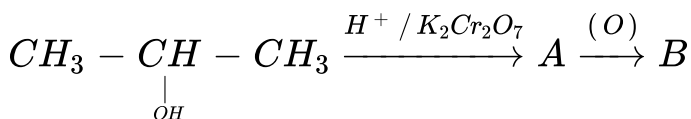
7. What type of hybridisations are possible in the following geometeries? (a) octahedral (b) tetrahedral © square planar.

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8. How will you prepare Lassaigne's extract ?

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9. Complete the reactions and identify the products.

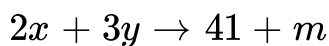




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Part iii

1. The balanced equation for a reaction is given below



When 8 moles of x react with 15 moles of y , then

Which is the limiting reagent ?

(b) Calculate the amount of products formed.

Calculate the amount of excess reactant left at the end of the reaction.

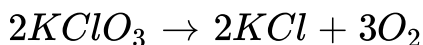


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2. Which would you expect to have a higher melting point, magnesium oxide or magnesium fluoride? Explain your reasoning.

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3. A sample of solid $KClO_3$ (potassium chlorate) was heated in a test tube to obtain O_2 according to the reaction



The oxygen gas was collected by downward displacement of water at 295K. The total pressure of the mixture is 772 mm of Hg. The vapour pressure of water is 26.7 mm of Hg at 300K. What is the partial pressure of the oxygen gas ?

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4. List the characteristics of entropy.

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5. Derive the value of K_C and K_P for the synthesis of HI.

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6. Describe the classification of organic compounds based on their structure.

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7. For the following bond cleavages use curved-arrows to show the electron flow and classify each as homolytic or heterolytic

fission. Identify reactive intermediate produced as free radical, carbocation and carbanion ?



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8. A alkyl halide with molecular formula $C_6H_{13}Br$ on dehydrohalogenation gave two isomeric alkenes X and Y with molecular formula C_6H_{12} . On reductive ozonolysis, X and Y gave four compounds CH_3COCH_3 , CH_3CHO , CH_3CH_2CHO and $(CH_3)_2CHCHO$. Find the alkyl halide.

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9. What do you mean by ozone hole? What are its consequences?

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Part IV

1. (i) Balance the following equations by ion electron method.



(ii) Boric acid, H_3BO_3 is a mild antiseptic and often used as eye wash. A sample contains 0.543 mol H_3BO_3 . What is the mass of boric acid in the sample?

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2. (i) How many unpaired electrons are present in the ground state of Fe^{3+} ($z = 26$), Mn^{2+} ($z = 25$) and argon ($z=18$)?

Explain about the significance of de Broglie equation.

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3. (i) Mention any two anomalous properties of second period elements.

(ii) Arrange Na^+ , Mg^{2+} and Al^{3+} in the increasing order of ionic radii. Give reason.

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4. (i) How do you expect the metallic hydrides to be useful for hydrogen storage ?

(ii) Write a note about ortho water and para water.

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5. Derive the value of critical constants the Van der Waals constants.

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6. Derive the value of K_P and K_C for dissociation of PCl_5 .

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7. (i) Solubility of a solid solute in a liquid solvent increase with increase in temperature. Justify this statement.

(ii) Explain How non-ideal solutions shows positive deviation from Raoult's law.

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8. (i) How will you distinguish between electrophiles and nucleophiles?

(ii) Complete the following reactions and identify the products ?

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9. (i) Is it possible to prepare methane by kolbe's electrolyte method.

(ii) Explain how 2-butyne reacts with (a) Lindlar's catalyst (b) Sodium in liquid ammonia.



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10. (i) Discuss the aromatic nucleophilic substitution reactions of chlorobenzene.

(ii) $CCL_4 > CHCl_3 > CH_2Cl_2 > CH_3Cl$ is the decreasing order of boiling point in haloalkanes. Give reason.



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