



CHEMISTRY

BOOKS - UNITED BOOK HOUSE

2014 QUESTION PAPER

Exercise

1. In Bohr's model of atom the lowest angular momentum, that an electron may have is

A. h

B. 0

C. $\frac{h}{2\pi}$

D. $\frac{h}{\pi}$

Answer:



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2. Which of the following is paramagnetic?



Answer:



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3. Which bond among the following is least ionic?



D. F-F

Answer:



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4. For a definite mass of an ideal gas at constant temperature, V versus $1/P$ plot is a

A. parabola

B. straight line

C. hyperbola

D. rectangular hyperbola.

Answer:



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5. Which of the following is an example of a closed system?

- A. A hot water filled thermoflask
- B. An ice water filled airtight metallic bottle
- C. A water filled stainless steel bowl
- D. A hot water filled glass beaker.

Answer:



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6. Which of the following is an intensive property of a system?

- A. Internal energy
- B. Entropy
- C. Mass
- D. Denstiy

Answer:

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7. The equilibrium constant (K_p) of a gaseous reaction is dependent on

- A. a) the total pressure
- B. b) the temperature
- C. c) the concentration of the reactants
- D. d) the presence of an inert gas.

Answer:

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8. Which of the following is thermally least stable?

- A. LiF

B. KCl

C. RbF

D. CsF

Answer:



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9. Which of the following pairs is responsible for developing an electric potential across the membrane of living cells?

A. Ca^{2+} and Na^{+}

B. K^{+} and Ba^{2+}

C. Na^{+} and K^{+}

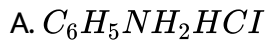
D. Mg^{2+} and Ca^{2+}

Answer:

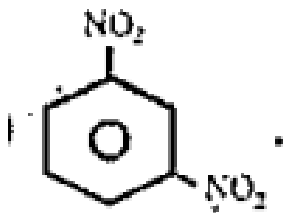


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10. Which of the following compounds does not respond to Lasaigne test for nitrogen?



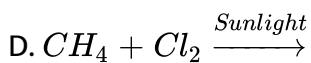
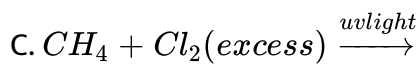
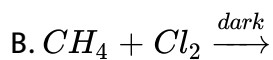
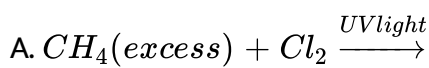
D.



Answer:

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11. The reaction condition leading to best yield of methyl chloride is



Answer:

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12. How many types of carbon atoms are present in 2, 2, 3 trimethylpentane?

A. 1

B. 2

C. 3

D. 4

Answer:

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13. Acid rain is a dilute aqueous solution of which of the following pairs of acids ____

A. H_2SO_4 and HCl

B. H_2CO_3 and HCl

C. H_2SO_4 and HNO_3

D. HNO_3 and HCl .

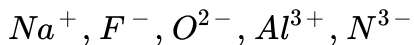
Answer:

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14. Fill in the blank : Metallic property of elementsdown the group in periodic table.

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15. Arrange the following in increasing order of ionic radius :



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16. In a process, 600 J of heat is absorbed by a system and 300 J of work is done by the system. Calculate the change in internal energy of the system.

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17. Latent heat of vaporisation of the water at normal boiling point is $40.75 \text{ kJ mol}^{-1}$. Calculate the change in entropy of vaporisation.

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18. How would you convert? $CH_2 = CH_2 \rightarrow HC \equiv CH$

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19. A compound, on analysis shows C = 40%, H = 6.67% and O = 53.33%. Determine the empirical formula of the compound. If molar mass of the compound is 30g mol^{-1} , what is its molecular formula?

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20. Calculate the percentage composition of the compound having the molecular formula of $C_6H_{12}O_6$ (H = 1, C = 12, O = 16).

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21. $PbCl_4$ is less stable than $SnCl_4$ while $PbCl_2$ is more stable than $SnCl_2$. Justify or contradict.

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22. B- F bond is polar but BF_3 does not have a dipole moment — why?

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23. What type of fission of a covalent bond produce free radicals? Give an example with proper sign.

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24. Draw the structure of the following compound :3, 4 - dimethylpentanoic acid

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25. Write one effect of depletion of ozone layer and one measure for the prevention of ozone layer depletion.

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26. State the Heisenberg uncertainty principle. Calculate the de Broglie wavelength associated with an electron moving with velocity of $1.0 \times 10^7 \text{ ms}$. (Mass of an electron : $9.1 \times 10^{-31} \text{ kg}$).

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27. When hydrogen, combines with oxygen, a polar covalent product is formed— Explain.

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28. What types of bonds are present in KHF_2 ?

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29. Why H_2 is a stable molecule but He_2 is not?

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30. Write canonicals of ClO_4^-

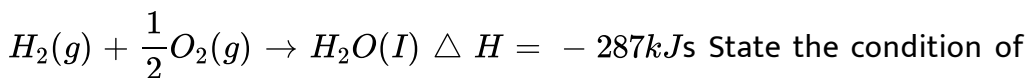
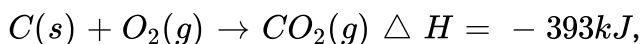
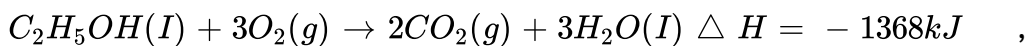
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31. A gas of molar mass $84.5g/mol$ is enclosed in a flask at $27^\circ C$ has a pressure of 2 atm. Calculate the density of the gas.

$$[R = 0.082LatmK^{-1}mol^{-1}]$$

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32. Calculate the enthalpy of formation of liquid, ethyl alcohol from the following data :



State the condition of spontaneity and equilibrium in terms of Gibbs free energy change of a system.

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33. For a gaseous reaction in a closed container establish the thermodynamic relation, $\Delta H = \Delta E + \Delta nRT$. (H = Enthalpy, E = Internal energy, N = No. of moles). Which variable is kept- constant in an isochoric process?

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34. Balance the equation in ion electronic method,
 $K_2Cr_2O_7 + FeSO_4 + H_2SO_4 \rightarrow K_2SO_4 + Cr_2(SO_4)_3 + Fe_2(SO_4)_3 + H_2O$

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35. Balance the following reaction by oxidation number method :
 $I_2 + HNO_3 \rightarrow HIO_3 + NO_2 + H_2O$ Calculate the oxidation number of Cl in $HClO_4$

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36. Hydrogen can be placed in Group 17 instead of Group 1 of periodic table. Give reason.

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37. What is heavy water? Why is it so called?

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38. The halides of alkali metals are soluble in water except for LiF. Why?

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39. What is diagonal relationship? Give one example.

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40. Draw the canonicals of CH_3COOH and CH_3COO^- . In which case resonance is more important? Answer with reason.

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41. Write the principle of estimation of carbon and hydrogen in an organic compound.

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42. Consider the equilibrium : $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g) + \text{heat}$
Apply the Le Chatelier's principle to explain the effects of pressure, temperature, and addition of inert gas at constant volume on the equilibrium yield of NH_3 . What is buffer solution? Give one example of the buffer solution.

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43. Calculate the pH of 0.1(M) NH_4OH at $25^\circ C$. The dissociation constant of NH_4OH at $25^\circ C$ is 1.76×10^{-5} .

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44. Why PbO_2 is oxidising?

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45. Explain why $TiCl$ is known but $Al Cl$ is not known.

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46. Which of the following is thermodynamically most stable form of carbon? Coke, diamond, graphite, fullerenes.

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47. What is effective electrophile in the nitration of benzene with mixed acid? How is it generated? Write down the mechanistic steps of the reaction.

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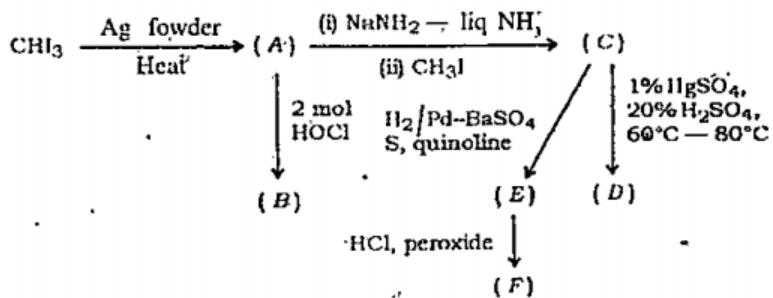
48. Two different compounds produce only acetaldehyde on ozonolysis. Draw the structures of the two compounds.

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49. Draw the eclipsed and staggered conformations of ethane and comment on the relative stabilities of the two conformations.

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50. Identify (A)— (F) in the following reactions:



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