



CHEMISTRY

BOOKS - UNITED BOOK HOUSE

QUESTION PAPER 2015

Exercise

1. Which one of the following conversions is correct among the following sets of quantum number?

A. $n = 5, l=2, m=1, s=1/2$

B. $n = 3, l =1, m= 0. s=+1/2$

C. $n = -5 ,l = l, m = 2, S = 1/2$

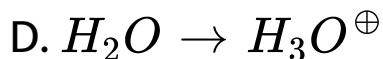
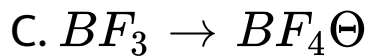
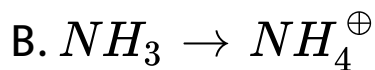
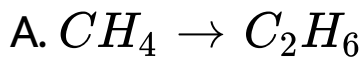
D. $n = 4,l = l , m = - 2,S = 1/2$

Answer:



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2. In which of the following conversions there are changes of hybridisation and shape?

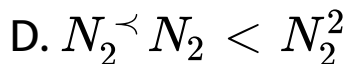
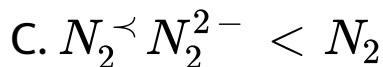
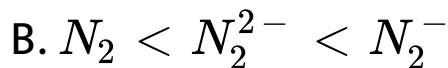
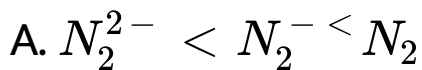


Answer:



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3. The correct bond order of Nitrogen and its different ions is



Answer:



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4. Which one of the following compounds is not polar?

A. N_2O

B. H_2O

C. NF_3

D. BF_3

Answer:



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5. Which gas among the following exhibits maximum critical temperature?

A. N_2

B. O_2

C. CO_2

D. H_2

Answer:



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6. Which one is the correct unit of entropy?

A. $K^{-1}mol^{-1}$

B. $JK(-1)mol^{-1}$

C. $Jmol^{-1}$

D. $J^{-1}K^{-1}mol^{-1}$

Answer:



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7. For the reversible reaction $A + 2B \leftrightarrow C +$

Heat the forward reaction will proceed at

A. Low temperature and low pressure

B. Low pressure

C. high pressure and low temperature

D. high pressure and high temperature

Answer:



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8. Which one the following is true for a spontaneous process?

A. $\Delta G = 0$

B. $\Delta H = T\Delta S$

C. $\Delta G > 0$

D. $\Delta G < 0$

Answer:



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9. Which one of the following compounds is not polar?



B. $NaCl$

C. $MgCl_2$

D. $BeCl_2$

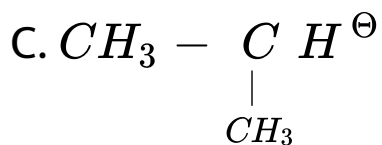
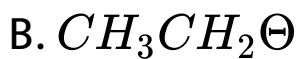
Answer:



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10. Which one of the carbonions is the most stable?

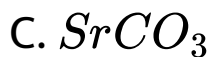
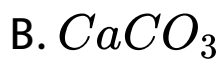
A. CH_3^-



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11. Which of the following alkaline earth metal carbonates is thermally least stable?





Answer:



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12. Which one of the following acids is used in friendel-Craft's reaction?



B. HCl

C. HNO_3

D. BF_3

Answer:



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13. Which reagent can be used to distinguish between the Propene and propyne?

A. Concentrated SO_4

B. Br_2 and Cl_4

C. Dilute H_2SO_4

D. Ammonical $AgNO_3$

Answer:



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14. Which of the following metallic air pollutants is present in the gas emitted by motor vehicles

A. Iron

B. Lead

C. Copper

D. Mercury

Answer:

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15. Between 100 ml CO_2 and 100 ml NH_3 . which one has greater mass at constant temperature and pressure?

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16. Write the number of molecules present in one millions of SO_2

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17. What will be the order of Na , Mg , Al and Si in terms of first ionization. enthalpy?

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18. Arrange the following ions in ascending order of their ionic radii Na^+ , F^- , O^{2-} , Mg^{2+} .



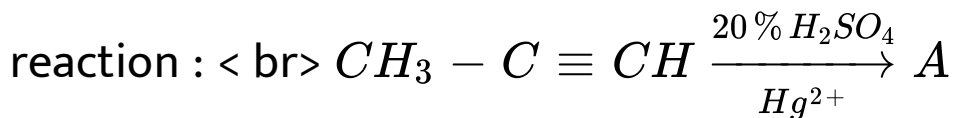
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19. Write the name and the structural formula of the product obtained when hydrogen bromide reacts with propene in presence of benzoyl peroxide.



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20. Identify the compounds A in the following



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21. How many moles of H_2SO_4 will be present as a residue when 3.0115×10^{21} number of molecules are removed from 400 mg H_2SO_4 ?

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22. Explain why CCl_4 is not hydrolysed while SiCl_4 is hydrolysed

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23. What happens when borax is heated strongly?

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24. Why are the dihalides of carbon unstable but the dihalides of tin and lead are stable?



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25. Why is the aqueous solution of borax alkaline?

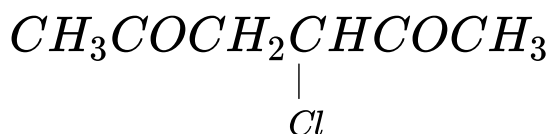


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26. Why can CH_3CN behave both as nucleophile and electrophile?

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27. Write down the IUPAC name of the following compound:



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28. Write down the structural formula of the following compound Hex-1-ene-4-yne

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29. Arrange the following radicals in increasing order of -I effect. 1, Br, Cl, F



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30. Write the structural formula of the following compound 5-amino pent-3-enoic acid.



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31. State the Pauli exclusion principle. write the electronic configurations. of $_{24}\text{Cr}^{3+}$ and $_{26}\text{Co}^{(3+)}$

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32. Why is the electron gain enthalpy of oxygen is less than that of sulphur?

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33. Arrange the following metal oxides in terms of ascending order of basicity. ZnO, MgO, CaO, CuO.

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34. Why is the first ionization enthalpy of helium maximum among all the elements?

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35. Arrange the following compounds in terms of ascending order of oxidising property: HCl, HBr, HI, HF.

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36. Why are the bond angles of NH_3 and H_2O less than the normal values of regular tetrahedron bond angles in spite of being sp^3 hybridised?

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37. Find out the bond order of H_2^+ ion.

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38. What are the types of hybridisation of NH_4^+ , CO_3^{2-} , H_2S and SF_6 ?

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39. C-O bond is polar but CO_2 does not have a dipole moment. Why?



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40. Explain the nature of the graphs of $\log P$ versus $\log V$ and $\log V$ versus $\log T$.



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41. Write the units of Vander Waals constants a and b.



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42. Why is the enthalpy change for a chemical reaction more important than internal energy change?



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43. What is meant by an isolated system in thermodynamics?



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44. Find out the heat of formation of CH_3COOH . Given that the heat of combustion of CH_3COOH is -867 KJ mol^{-1} and the heat of formation of CO_2 and H_2O are -393.5 and $-285.9 \text{ KJ mol}^{-1}$ respectively.



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45. Balance the following chemical equation by ion by oxidation number of method : $\text{NaNO}_3 + \text{Zn} + \text{NaOH} \rightarrow \text{NH}_3 + \text{Na}_2\text{ZnO}_2 + \text{H}_2\text{O}$.

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46. Give an example of a compound where the constituent element exhibit fractional oxidation number.

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47. Although KHF_2 is a stable compound, $KHBr_2$ does not exist Explain why.



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48. What happens when H_2O_2 is mixed with cold acidic potassium dichromate solution?



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49. Why is LiCl soluble in organic solvent?

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50. Why are fumes seen when barium halides are kept in open air?

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51. Alkali metals become opaque when they are kept open in air Why?



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52. Write the basic principles of Solvay process.



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53. Arrange the following compounds with ascending order of boiling point :

HF , H_2O , NH_3



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54. $BaSO_4$ is insoluble in water, but $BeSO_4$ is soluble in water - Explain.

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55. Why is $CH_3)_3(c^\oplus)$?

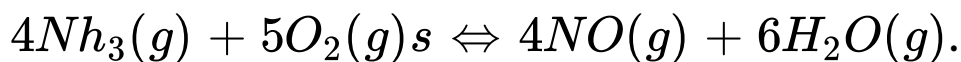
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56. Indicate the electrophilic centre of the following compounds: CH_3CHO , CH_3CN



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57. (i)



Write the K_p and K_c values for the above reaction and also make a relation between them.

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58. What is meant by solubility product?

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59. pH of 0.2 mol L^{-1} chloroacetic acid is 1.7.

Find out the degree of dissociation of this chloroacetic acid.



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60. (i) At 1000 K temperature CO_2 has pressure fo 0.5 atm in a closed container. On adding some amount of graphite inside the container some amount of graphite inside the container. some amount of CO_2 is converted to CO. At

equilibrium the pressure becomes 0.8 atm. Find out the value of k_p



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61. What amount of CH_3COONa is to be added to one litre of $0.1(M)CH_3COOH$ solution so that the pH becomes 4.0? [$K_a = 1.8 \times 10^{-3}$].



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62. What happens when NaOH reacts with Phosphorous ?



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63. NaOH solution is added to $Al_2(SO_4)_3$ solution?



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64. All the carbon-Oxygen bonds in CO_3^{2-} radical are equivalent- Explain.

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65. What is meant by common ion effect?

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66. What will be the major product when propyne is treated with aqueous H_2SO_4 ?

Explain with equation.

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67. An Alkene gives same product on ozonolysis and on oxidation with $KmnO_4$. Write down the structure of the alkene and give arguments in favour of your answer.

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68. An organic compound (A), C_7H_8O is insoluble in aqueous $NaHCO_3$ but soluble in NaOH. (A), on treatment with bromine water rapidly forms compound (B), $C_7H_5OBr_3$. Give structures of (A) and (B). What will be (A), if it does not dissolve in NaOH solution but shows reactions given above?



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69. Diethyl ether behaves as a base- Explain the statement.



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70. Among benzene and toluene, which one will undergo nitration reaction easily and Why?



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71. What happens when hypo is added to aqueous copper ions?



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