CHEMISTRY

BOOKS - UNITED BOOK HOUSE

MP_1

Exercise

1. For NaCl, r_{Na} + / r_{Cr}= 0.525. The ration of the co-ordination numbers of the ions is

A. $6:6$

B. $4:4$

C. $8:4$

D. $6:12$

Answer:

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2. Colligative properties are those properties that depend on the

A. nature of solute

B. size of solute particles

C. greater than one

D. number of solute particles

Answer:

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3. When solute associates in a solution, the value of Vant Hoff factor is,

A. equal to one

B. less than one

C. greater than one

D. either (b) or (c)

Answer:

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4. For a cell reaction involving two electron changes the standard emf of the cell is found

to be 0.295V at 25C. The equilibrinm constant of the reaction at $25^{\circ}C$ will be?

A. 1.0×10^{-10}

B. 29.5×10^{-10}

C. 10.0

D. 1.0×10^{10}

Answer:

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5. The rate constant of a reaction is $1.8 \times 10^3 \ \text{min}^{-1}$. What is the order of the reaction?

A. Zero

B. One

C. Two

D. None of these

Answer:

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6. On which of following does the rate of a reaction depend?

A. Temperature

B. Concentration of reactant

C. Pressure

D. All of these

Answer:

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7. The hybridisation of phosphoruse in PCI_3 is

A. Sp^2

B. Sp^3d

C. Sp^3d^2

D. Sp^3

Answer:

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8. Which of the following contains 0-0 linkage?

A. H_2SO_3

B. $H_2S_2O_3$

C. H_2SO_4

D. $H_2S_2O_8$

Answer:

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9. Which of the following is most acidic?

A. phenol

B. Benzyl alchol

C. m-chlorophenol

D. Cychlohexanol

Answer:

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10. Which of the following is used to distiguish between CH_3CHO and C_6H_5CHO?

A. Tollens reagnet

B. Benedicts reagent

C. Schiff base

D. Iodoform reaction

Answer:

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11. Which of the following is most basic?

A. $C_6H_5NH_2$

B. $p - NO_2 - C_6H_4NH_2$

C. $\bar{m}NO_2 - C_H \_ 4NH_2$

D. $C_6H_5CH_2NH_2$

Answer:

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12. In respect of which base does RNA differ from DNA?

A. Thymine

B. Adenine

C. Cytosine

D. Guanine.

Answer:

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13. An ester is hydrolysed by KOH and acidified to get a wite pricipitate.The ester is

A. Methyl acetate

B. Ethyl acetate

C. Ethyl formate

D. Ethyl banzoate

Answer:

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14. As_2S_3 sol has a negative charge. Which of the following has the maxium power to precipitate it?

A. H_2SO_4

B. Na_3PO_4

C. $CaCI_2$

D. $AICI_3$

Answer:

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15. Consider the reaction:

$Cr_2O_7^{2-} + I4H^+ + 6e \rightarrow 2Cr^{3+} + 7H_2O.$

What is the quantity of electricity in coulumbs needed to reduce 1 mol of $Cr_2O_7^{2-}$?

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16. Write two differeneces between physisorption and chemisorption.

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17. Give one reason why a finely divided substance is more effective as an addorbent?

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18. The atomic sizes of $_{26}Fe_{27}Co$ and $28Ni$ are nearly same. Explain with a reason.

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19. Why ${}_{30}Zn^{2+}$ salts are white while ${}_{29}Cu^{2+}$ salts are blue?

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20. Give an example of an artifical sweetener whose use is limited to cold drinks.

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21. A solutioln of $CuSO_4$ is electrolysed for 10 mins wite a current of 1.5 amperes. What is the mass of copper wire dipped in 0.1 (M) $CuSO_4$ Solution at $25^\circ C$.The standard elecrode potential for copper is 0.34 Volt.

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22. What are 'micelles'? Give an example of heterogenous catalysis.

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23. Between white & red phosphorus which one is more reactive & why?

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24. Explain the following: HF acid is stored in wax coated galss bottles.

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25. Explain the following: $HClO_4$ is a stronger acid than H_2SO_4.

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26. Write the IUPAC name for the coordination compound $Fe_4\left[Fe(CN)_6\right]_3$

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27. Explain why $\left[Co(NH_3)_6\right]^{3+}$ ion is diamagnetic. [Z for Co=27]. By using VBT discuss the geometry & magnetic nature of $\left[Cr(NH_3)_6\right]^{3+}$ [given z for Cr =27]

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28. What is co-polymer? Give example.

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29. What is Frenkel Defect?

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30. Two ions A^+ and B^- have raddi 88 and 200 pm respectively. In the close packed crystal of compound AB, predic the coordination number of A^+.

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31. What is sehottky defect?

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32. Gold (at mass 19^{-} at radius=0.114 nm) crystallizes in a FCC unit cell. Calculate the density of gold.

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33. Calculate ΔG° in $kJmol^{2+}$ and equilibrium constant for the following cell reaction:

$Zn(s) + Cu^{2+}(aq) \leftrightarrow Cu(s) + Zn^{2+}(aq)$

[Give: E_(Zn^(2+)//Zn)^@=-0.76 V, E_(Cu^(2+)//Cu)^@=+0.34V,F=96500 C mol^(-1)]`

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34. Differentiate between the following: Calcination and roasting

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35. Differentiate between the following: Gangue and flux

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36. Differentiate between the following: Galvanization and tin plating.

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37. Write chemical equations for the following reactions: Oxidation of Fe^{2+} ion by MnO_4^- in acidic solution.

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38. Write chemical equations for the following reactions: Metallic copper reacts with hot, concentrated nitric acid.

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39. Write chemical equations for the following reactions: Iodine reacts with sodium thiosulfate solution.

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40. Explain with reason the following: Cu^+ ion does not form coloured salts like Cu^{2+} ion.

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41. Explain with reason the following: The (+3) oxidation states of `La(Z=57) and Lu(Z=71) are especially stable.

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42. An alkylhalide (A), on reaction with Mg in dry ether followed by treatment with ethanol gave 2-methylbutane. Write all the possible structures of 'A'. Give arrow-head equation for the formation of 2-methly-butane from any one isomer of A

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43. Chlorobenzene on mononitration with mixed acid gives mainly a mixture of two products.Write an arrow head equation of the reaction and explain why these two compounds are mainly formed.

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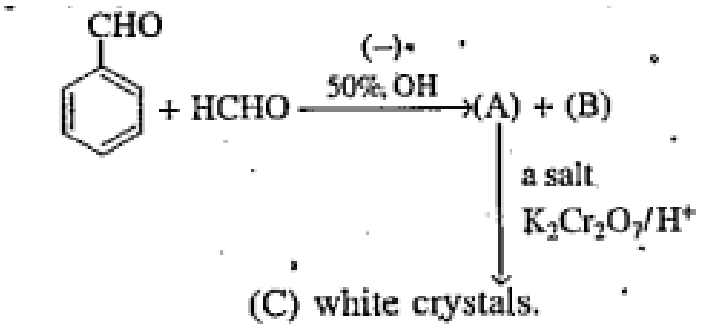
44. Identify A, B, C:



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45. An organic compound 'A' (C_2H_6O) reacts with sodium to form a compound 'B' with the

evolution of hydrogen gas and gives a yellow compound 'C' when treated with iodine and NaOH. When heated with conc. H_2SO_4 at $140^\circ C$ it gives a compound 'D' C_4H_{10} which on treatment with HI at $100^\circ C$ gives 'E'. 'B' when heated with 'E' also gives back 'D'. Identify 'A' to 'E' and write equations for the reaction involved.

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46. Equimdal solutions of NaCI and $BaCI_2$ are prepared in water. The Freezing point of NaCI is found to be $-2^{\circ}C$.What will be the freezing point for $BaCI_2$ solution?

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47. Give example of a anit-freeze.

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48. Why is the vapour pressure of an aqueous solution of glucose lower that that of water?

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49. Calculate the mass of urea $\left[CO(NH_2)_2\right]$ required in making 2.5 kg of 0.25 molal aqueous solution.

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50. A compound (A) (C_7H_4N) on hydrolysis with strong aqueous acid gives another compound (B) on treatment with ammonia gives a salt which on heating gives (C). The compound (C) undergoes Hofmann's bromamide reaction to yield aniline. Identify A, B, C and write chemcial reactions involved.

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51. Convert: Glucose $\rightarrow$ Glueosazone.

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52. Define petide bond with an example.

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53. Write the name and structure of the monomer of natrual rubber.

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54. Explain the following terms: Molecularity of a reaction.

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55. Explain the following terms: Energy of activation.

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56. The time required of 10% completion of a first order reaction at 298K is equal to that required for its 25% completion at 308K. If the pre-exponential factor for the reaction is $3.56 \times 10^9 S^{-1}$. Calculate. Its rate constant at 318K and also the energy of activiation. [R=8.314 $JK^{-1}mol^{-1}$.

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57. Explain the following terms: Order of a reaction

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58. Explain the following terms: rate of a reaction.

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59. The half life of a first order decomposition of NH_2NO_2 is 2.1 hour at $15^\circ C$ $NH_2NO_2(aq) \rightarrow N_2O(g) + H_2O(I)$ If 6.2g of NH_2NO_2 is allowed to decompose, calculate (i) tiem take for NH_2NO_2 to decompose 99% and (ii) volume of dry N_2O produced at this point, measured at S.T.P.

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60. Draw the structure of the following: P_4O_{10}

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61. Draw the structure of the following: SF_4

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62. Explain the following: The reduction of Cr_2O_3 with AI is thermodynamically feasible yet it does not occur at room tem-perature.

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63. How is wrought iron different from steel?

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64. Write (A) to (J) in the following reaction sequence:

$$CH_3 - \overset{\overset{O}{||}}{C} - CH_2CH_3 \xrightarrow{LiAlH_4} A \xrightarrow[170^\circ C]{conc.\,H_2SO_4} B + C$$

(major)

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65. What are (A) to (J) in the following reaction sequence?

$$H_2C - CHO \xrightarrow[\Delta]{SeO_2} (D) \xrightarrow{alk.KMnO_4} (E)(solid)$$

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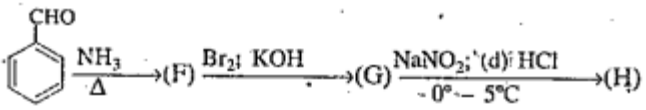
66. What are (A) to (J) in the following reaction sequence?

(iii) 

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67. What are (A) to (J) in the following reaction sequence?

$$H_2C - CHO \xrightarrow[\Delta]{SeO_2} (D) \xrightarrow{alk.KMnO_4} (E)(solid)$$

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68. What are (A) to (J) in the following reaction sequence? $CH_3NH_2 \xrightarrow{J} CH_3OH$

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69. Give chemcial tests to distinguish between the following: Chlorobenzene & benzyl chloride.

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70. Give chemcial tests to distinguish between the following: acetone & acetalde-hyde

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71. How will you convert: Phenol $\rightarrow$ Anisole (one step)

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72. How will you convert: Metaodinitro benzene $\rightarrow$ Metal nitro aniline (one step)

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73. How will you convert: Toluene $\rightarrow$ Benzaldehyde (one step)

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