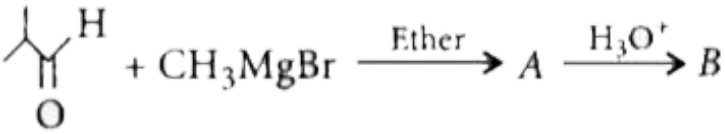
CHEMISTRY

BOOKS - KCET PREVIOUS YEAR PAPERS

KARNATAKA CET 2014

Chemistry

1. 

The IUPAC name of B is

A. 3-methylbutan-2-ol

B. 2-methylbuta-3-ol

C. 2-methylbutan-2-ol

D. pentan-2-ol.

Answer: A

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2. For Freundilich isotherm a graph of $\log \frac{x}{m}$ is plotted against log P. The slope m of the line and its y-axis intercept, respectively corresponds to

A. $\frac{1}{n}, k$

B. $\log. \frac{1}{n}, k$

C. $\frac{1}{n}, \log k$

D. $\log. \frac{1}{n}, \log k$

Answer: C

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3. A plot of $\frac{1}{T}$ Vsk for a reaction gives the slope $-1 \times 10^4 K$. The energy of activation for the reaction is

(Given $R = 8.314 JK^{-1} \text{ mol}^{-1}$)

A. 8314J mol^{-1}

B. 1.202kJ mol^{-1}

C. 12.02J mol^{-1}

D. 83.14kJ mol^{-1}

Answer:

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4. The IUPAC name of the complex ion formed when gold dissolves in aquaregia is

A. tetrachloridoaurate (III)

B. tetrachloridoaurate (I)

C. tetrachloridoaurate (II)

D. dichloridoaurate (III).

Answer: A

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5. The correct sequence of reactions to be performed to convert benzene into m-bromoaniline is

A. nitration, reduction, bromination

B. bromination, nitration, reduction

C. nitration, bromination, reduction

D. reduction, nitration, bromination.

Answer: C

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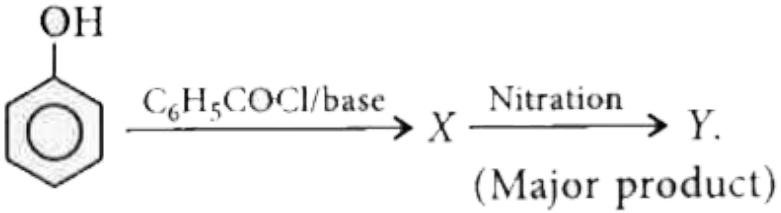
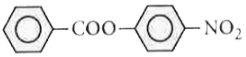
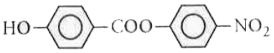
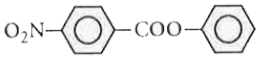
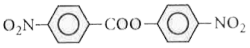
6. 

Y is

A. 

B. 

C. 

D. 

Answer: A

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7. $A_{(g)} \xrightarrow{\Delta} P_{(g)} + Q_{(g)} + R_{(g)}$, follows first order kinetics with a half life of 69.3 s at 500° C. Starting from the gas 'A' enclosed in a container at $500^\circ C$ and at a pressure of 0.4 atm, the total pressure of the system after 230 s will be

A. 1.15 atm

B. 1.32 atm

C. 1.22 atm

D. 1.12 atm

Answer: D

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8. $MnO_2 + HCl \xrightarrow{\Delta} A_{(s)}$

$A_{(g)} + F_{2(\text{excess})} \xrightarrow{573K} B_{(s)}$

$B_{(l)} + U_{(s)} \rightarrow C_{(g)} + D_{(g)}$

The gases A,B,C and D are respectively

A. Cl_2, ClF, UF_6, ClF_3

B. Cl_2, ClF_3, UF_6, ClF

C. $O_2, OF_2, U_2O_3, O_2F_2$

D. $O_2, O_2F_2, U_2O_3, OF_2$

Answer: B

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9. Acetophenone cannot be prepared easily starting from

A. $C_6H_5CH(OH)CH_3(b)$

B. $C_6H_5CH_3$

C. $C_6H_5C \equiv CH$

D. C_6H_6

Answer: B

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10. One mole of ammonia was completely absorbed in one litre solution each of (a) 1 M HCl, (b) 1 M CH_3COOH and (c) 1 M H_2SO_4 at 298 K.

The decreasing order for the pH of the resulting solution is (Given $K_b(NH_3) = 4.74$)

A. $2 > 3 > 1$

B. $1 > 2 > 3$

C. $2 > 1 > 3$

D. $3 > 2 > 1$

Answer: C

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11. 5.5 mg of nitrogen gas dissolves in 180 g of water at 273 K and one atm pressure due to nitrogen gas. The mole fraction of nitrogen in 180 g of water at 5 atm nitrogen pressure is approximately

A. 1×10^{-6}

B. 1×10^{-5}

C. 1×10^{-3}

D. 1×10^{-4}

Answer: C

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12. $50cm^3$ of 0.04 M $K_2Cr_2O_7$ in acidic medium oxidizes a sample of H_2S gas to sulphur. Volume of 0.03 $MKMnO_4$ required to oxidize the same amount of H_2S gas to sulphur, in acidic medium is

A. $60cm^3$

B. $80cm^3$

C. $90cm^3$

D. $120cm^3$

Answer: B

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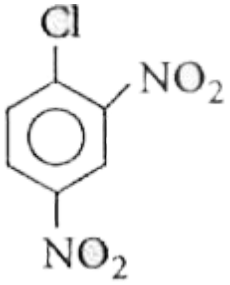
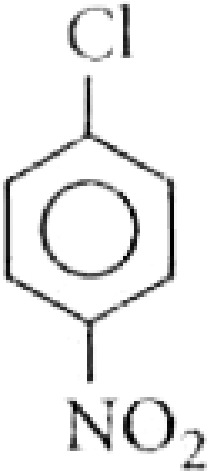
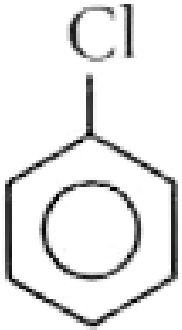
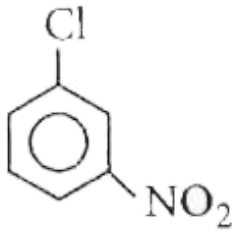
13. The compound that reacts the fastest with sodium methoxide is

A. 

B. 

C. 

D. 

Answer: A

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14. The pair of compounds having identical shapes for their molecules is

A. CH_4, SF_4

B. BCl_2, ClF_3

C. $XeF_2, ZnCl_2$

D. SO_2, CO_2

Answer: C

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15. Conductivity of a saturated solution of a sparingly soluble salt AB at 298 K is $1.85 \times 10^{-5} Sm^{-1}$. Solubility product of the salt AB at 298 K is

Given $\wedge_m^0 (AB) = 140 \times 10^{-4} Sm^2 \ \ \text{mol}^{-1}$

A. 5.7×10^{-12}

B. 1.32×10^{-12}

C. 7.5×10^{-12}

D. 1.74×10^{-12}

Answer: D

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16. An incorrect statement with respect to S_N1 and S_N2 mechanisms for alkyl halide is

A. a strong nucleophile in an aprotic solvent increases the rate or favours S_N2 reaction

B. competing reaction for an S_N2 reaction is rearrangement

C. S_N1 reactions can be catalysed by some Lewis acids

D. a weak nucleophile and a protic solvent increases the rate or favours S_N1 reaction.

Answer: B

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17. Butylated hydroxy toluene as a food additive acts as

A. antioxidant

B. flavouring agent

C. colouring agent

D. emulsifier.

Answer: A

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18. Terylene is NOT

A. copolymer

B. polyester fibre

C. chain growth polymer

D. step growth polymer.

Answer: C

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19. The correct statement is

A. cyclohexadiene and cyclohexene cannot be isolated with ease during controlled hydrogenation of benzene

B. one mole each of benzene and hydrogen when reacted gives 1/3 mole of cyclohexane and 2/3 mole unreacted hydrogen

C. hydrogenation of benzene to cyclohexane is an endothermic process

D. it is easier to hydrogenate benzene when compared to cyclohexene.

Answer: A

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20. Among the elements from atomic number 1 to 36, the number of elements which have an unpaired electron in their S subshell is

A. 4

B. 7

C. 6

D. 9

Answer: C

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21. The statement that is NOT correct is

A. compressibility factor measures the deviation of real gas from ideal behaviour

B. van der Waals constant 'a' measures extent of intermolecular attractive forces for real gases

C. critical temperature is the lowest temperature at which liquefaction of a gas first occurs

D. Boyle point depends on the nature of real gas.

Answer: C

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22. The correct arrangement for the ions in the increasing order of their radii is

A. Na^+, Cl^-, Ca^{2+}

B. Ca^{2+}, K^+, S^{2-}

C. Na^+, Al^{3+}, Be^{2+}

D. Cl^-, F^-, S^{2-}

Answer: B

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23. The correct arrangement of the species in the decreasing order of the bond length between carbon and oxygen in them is

A. $CO, CO_2, HCO_2^-, CO_3^{2-}$

B. $CO_2, HCO_2^-, CO, CO_3^{2-}$

C. $CO_3^{2-}, HCO_2^-, CO_2, CO$

D. $CO, CO_3^{2-}, CO_2, HCO_2^-$

Answer: C

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24. The species that is not hydrolysed in water is

A. P_4O_{10}

B. BaO_2

C. Mg_3N_2

D. CaC_2

Answer: B

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25. For the properties mentioned, the correct trend for the different species is in

A. strength as Lewis acid - $BCl_3 > AlCl_3 > GaCl_3$

B. inert pair effect - $Al > Ga > In$

C. oxidising property - $Al^{3+} > In^{3+} > Tl^{3+}$

D. first ionization enthalpy - $B > Al > Tl$

Answer: A

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26. A correct statement is

A. A) $\left[Co(NH_3)_6\right]^{3+}$ is paramagnetic

B. B) $[MnBr_4]^{2-}$ is tetrahedral

C. C) $\left[CoBr_2(en)_2\right]^-$ exhibits linkage isomerism

D. D) $\left[Ni(NH_3)_6\right]^{2+}$ is an inner orbital complex.

Answer: A::B

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27. Iodoform reaction is answered by all, except

A. $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_2 - COOH$

B. CH_3CHO

C. $CH_3 - CH_2 - OH$

D. $CH_3 - CH_2 - CH_2OH$

Answer: D

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28. A crystalline solid XY_3 has ccp arrangement for its element Y. X occupies

A. 66% of tetrahedral voids

B. 33% of tetrahedral voids

C. 66% of octahedral voids

D. 33% of octahedral voids.

Answer: D

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29. $C_6H_5COOH \xrightarrow[2.\ \Delta]{1.\ NH_3} P \xrightarrow{NaOBr} Q \xrightarrow[2.\ \text{heat to}\ \ 460K]{1.\ Conc.\ H_2SO_4} 'R'$

'R' is

A. o-bromosulphanilic acid

B. sulphanilamide

C. sulphanilic acid

D. p-bromosulphanilamide.

Answer: C

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30. The statement that is NOT correct is

A. aldose or ketose sugars in alkaline medium do not isomerise

B. carbohydrates are optically active

C. penta acetate of glucose does not react with hydroxylamine

D. lactose has glycosidic linkage between C_4 of glucose and C_1 of galactose unit.

Answer: A

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31. Match the reactant in column-I with the reaction in column-II

Column-I		Column-II	
(i)	Acetic acid	(A)	Stephen
(ii)	Sodium phenate	(B)	Friedel-Crafts
(iii)	Methyl cyanide	(C)	HVZ
(iv)	Toluene	(D)	Kolbe's

A. i-C, ii-A, iii-D, iv-B

B. i-D, ii-B, iii-C, iv-A

C. i-B, ii-C, iii-A, iv-D

D. i-C, ii-D, iii-A, iv-B

Answer: D

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32. The statement that is NOT correct is

A. hypophosphorous acid reduces silver nitrate to silver

B. in solid state PCl_5 exists as $[PCl_4]^+[PCl_6]^-$

C. pure phosphine is non-inflammable

D. phosphorous acid on heating disproportionates to give metaphosphoric acid and phosphine.

Answer: D

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33. In which one of the pairs of ion given, there is an ion that forms a co-ordination compound with both aqueous sodium hydroxide and ammonia and an other ion that forms a co-ordination compound only with aqueous sodium hydroxide?

A. Pb^{2+}, Cu^{2+}

B. Zn^{2+}, Al^{3+}

C. Cu^{2+}, Zn^{2+}

D. Al^3, Cu^{2+}

Answer: B

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34. A crystalline solid X reacts with dil HCI to liberate a gas Y. Y decolourises acidified KMnO4. When a gas 'Z' is slowly passed into an aqueous solution of Y, colloidal sulphur is obtained. X and Z could be, respectively

A. Na_2S, SO_3

B. Na_2SO_4, H_2S

C. Na_2SO_3, H_2S

D. Na_2SO_4, SO_2

Answer: C

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35. An aromatic compound $'A'(C_7H_9N)$ on reacting with $NaNO_2/HCl$ at $0^\circ C$ forms benzyl alcohol and nitrogen gas. The number of isomers possible for the compound 'A' is

A. 5

B. 7

C. 3

D. 6

Answer: A

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36. The statement that is NOT correct is

A. a furnace lined with Haematite is used to convert cast iron to wrought iron.

B. collectors enhance the wettability of mineral particles during froth flotation.

C. in vapour phase refining, metal should form a volatile compound.

D. copper from its low grade ores is extracted by hydrometallurgy.

Answer: B

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37. A solution of 1.25 g of 'P' in 50 g of water lowers freezing point by $0.3^{\circ}C$. Molar mass of 'P' is 94. $K_{(\text{water})} = 1.86 Kkgmol^{-1}$. The degree of association of 'P'in water is

A. 0.8

B. 0.6

C. 0.65

D. 0.75

Answer: A

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38. Volume occupied by single CsCl ion pair in a crystal is $7.014 \times 10^{-23} c^3$. The smallest Cs-Cs internuclear distance is equal to length of the side of the cube corresponding to volume of one CsCl ion pair. The smallest Cs to Cs internuclear distance is nearly

A. 4.4Å

B. 4.3Å

C. 4Å

D. 4.5 Å

Answer: C

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39. For $Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{+3} + 7H_2O, E^\circ = 1.33V$ At $\left[Cr_2O_7^{2-}\right]$ = millimoles , $\left[Cr^{+3}\right] = 15$ millimole , E is 1.067V. The pH of the solution is nearly equal to

A. 2

B. 3

C. 5

D. 4

Answer: A

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40. 1.78 g of an optically active L-amino acid (A) is treated with $NaNO_2/HCl$ at 0° C. $448cm^3$ of nitrogen was at STP is evolved. A sample of protein has 0.25% of this amino acid by mass. The molar mass of the protein is

A. $36, 500 \mathrm{g\ mol}^{-1}$

B. $34, 500 \mathrm{g\ mol}^{-1}$

C. $35, 400 \mathrm{g\ mol}^{-1}$

D. $35, 600 \mathrm{g\ mol}^{-1}$

Answer: D

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41. 10 g of a mixture of BaO and CaO requires $100 cm^3$ of 2.5 M HCl to react completely. The percentage of calcium oxide in the mixture is approximately (Given : molar mass of BaO= 153)

A. 52.6

B. 55.1

C. 44.9

D. 47.4

Answer: A

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42. The ratio of heats liberated at 298 K from the combustion of one kg of coke and by burning water gas obtained from kg of coke is (Assume coke to be 100% carbon). (Given enthalpies of combustion of CO_2, CO and H_2 as 393.5 kJ, 285 kJ, 285 kJ respectively at 298 K).

A. $0.79:1$

B. $0.69:1$

C. $0.86:1$

D. $0.96:1$

Answer: B

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43. Impure copper containing Fe, Au, Ag as impurities is electrolytically refined. A current of 140 A for 482.5 s decreased the mass of the anode by 22.26 g and increased the mass of cathode by 22.011 g. Percentage of iron in impure copper is (Given molar mass Fe= 55.5 g mol^{-1}, molar mass Cu = 63.54 g mol^{-1})

A. 0.95

B. 0.85

C. 0.97

D. 0.90

Answer: D

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44. $25cm^3$ of oxalic acid completely neutralised 0.064 g of sodium hydroxide. Molarity of the oxalic acid solution is

A. 0.064

B. 0.045

C. 0.015

D. 0.032

Answer: D

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45. The statement that is NOT correct is

A. angular quantum number signifies the shape of the orbital.

B. energies of stationary states in hydrogen like atoms is inversely proportional to the square of the principal quantum number.

C. total number of nodes for 3s orbital is three.

D. the radius of the first orbit of He^+ is half that of the first orbit of hydrogen atom.

Answer: C

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46. For the equilibrium: $CaCO_{3(s)} \Leftrightarrow CaO_{(s)} + CO_{2(g)}, K_p = 1.64$ atm at 1000 K, 50 g of $CaCO_3$ in a 10 litre closed vessel is heated to 1000 K. Percentage of $\acute{C}aCO_3$ that remains unreacted at equilibrium is (Given R=0.082 L atm $K^{-1}\text{mol}^{-1}$).

A. 40

B. 50

C. 60

D. 20

Answer: C

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47. Conversion of oxygen into ozone is non-spontaneous at

A. all temperatures

B. high temperature

C. room temperature

D. low temperature.

Answer: A

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48. Density of carbon monoxide is maximum at

A. 2 atm and 600 K

B. 0.5 atm and 273 K

C. 6 atm and 1092 K

D. 4 atm and 500 K.

Answer: D

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49. Write the names of the following:

(i) $CH_3CH_2 - C \equiv CH$

(ii) CH_3CH_2OH

(iii) CH_3COCH_3.

A. $i > iii > ii$

B. $i > ii > iii$

C. $ii > i > iii$

D. $iii > i > ii$

Answer: C

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50. A metallic oxide reacts with water to from its hydroxide, hydrogen peroxide and also liberates oxygen. The metallic oxide could be

A. CaO

B. KO_2

C. Li_2O

D. Na_2O_2

Answer: B

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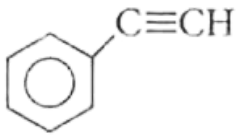
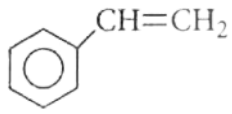
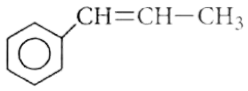
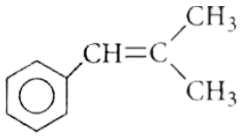
51. $X \xrightarrow[(\text{Reductive})]{\text{Ozonolysis}} Y + Z$

Y can be obtained by Etard's reaction, Z undergoes disproportionation reaction with concentrated alkali. X could be

A. 

B. 

C. 

D. 

Answer: B

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52. Gold sol is not a

A. a macromolecular colloid

B. a lyophobic colloid

C. a multimolecular colloid

D. negatively charged colloid.

Answer: A

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53. Carbocation as an intermediate is likely to be formed in the reaction :

A. Propene$+Cl_2 \xrightarrow{hv}$ 2- chloropropane

B. Acetone $+HCN \xrightarrow{^{-}OH}$ acetonecyanohydrin

C. Ethyl bromide $+Aq.\ KOH \xrightarrow{\Delta}$ ethyl alcohol

D. Hexane $\xrightarrow{\text{Anhy.}AlCl_3\ /\ HCl}$ 2-methylpentane

Answer: D

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54. For an ideal binary liquid mixture

A. $\Delta S_{(\text{mix})} = 0, \Delta G_{(\text{mix})} = 0$

B. $\Delta H_{(\text{mix})} = 0, \Delta S_{(\text{mix})} < 0$

C. $\Delta V_{(\text{mix})} = 0, \Delta G_{(\text{mix})} > 0$

D. $\Delta S_{(\text{mix})} = 0, \Delta G_{(\text{mix})} < 0$

Answer: D

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55. For hydrogen - oxygen fuel cell at one atm and 298 K

$H_{2(g)} + \frac{1}{2}O_{2(g)} \rightarrow H_2O_{(l)}, \Delta G^\circ = -240kJ$

E° for the cell approximately , (Given F = 96,500 C)

A. 2.48 V

B. 1.24 V

C. 2.5 V

D. 1.26 V

Answer: B

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56. Which one of these is not known?

A. $CuCl_2$

B. CuI_2

C. CuF_2

D. $CuBr_2$

Answer: B

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57. The correct statement is

A. the earlier members of lanthanoid series resemble calcium in their chemical properties.

B. the extent of actinoid contraction is almost the same as lanthanoids contraction.

C. in general, lanthanoids and actinoids do not show variable oxidation states.

D. Ce^{4+} in aqueous solution is not known.

Answer: A

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58. $P \xrightarrow[2.H_3O^+]{1.CH_3MgBr} R \xrightarrow[2.\Delta]{1.dil.NaOH} 4-$ methylpent -3-en-2-one

P is

A. propanone

B. ethanamine

C. ethanenitrile

D. ethanal.

Answer: C

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