CHEMISTRY

BOOKS - PATHFINDER CHEMISTRY (BENGALI ENGLISH)

S-BLOCK ELEMENTS

Question Bank

1. Why alkali metals are used as reducing agents?

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2. What is the order of reactivity of alkali metals ?

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3. How does NaH react with water?

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4. Find the oxidation state of sodium in Na_2O_2

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5. Why are alkaline earth metals harder than alkali metals?

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6. What is brine?

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7. Name the radioactive alkali metal?

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8. Out of Na and Mg which has higher second ionization enthalpy and why?

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9. Name the most abundant metal of gp-2

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10. Which elements among group-2 metals has the highest boiling point?

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11. What is Epsom salt?

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12. Give the names of carbonate ores of calcium and magnesium .

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13. The alkali metals have low densities . Explain.

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14. Name the metal which floats on water without any apparent reaction with it.

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15. Name the alkali metals which reacts the nitrogen of air. Write the chemical equation for the reaction involved.

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16. Name the alkali metals which forms superoxide when heated in excess of air and why?

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17. Write the formula of Albite and Glauber's salt.

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18. Predict giving reason the outcome of the reaction : $Lil + KF \rightarrow$

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19. Which two alkaline earth metals are kinetically inert towards oxygen and why?

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20. Why is $BeCO_3$ stored in carbon dioxide atmosphere?

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21. Write the chemical formula of Fluorspar and Anhydrite.

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22. What is dead burnt plaster?

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23. What is the mixture of $CaCN_2$ and carbon known as ?

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24. What are isomorphous salts?

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25. What is potash magnesis?

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26. Beryllium show diagonal relationship with

A. Mg

B. Na

C. Al

D. Rb

Answer:

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27. Dolomite is mineral whose formula is :

A. $CaCO_3$

B. $MgCO_3$

C. $CaCO_3 \cdot MgCO_3$

D. $CaSO_4 \cdot 2H_2O$

Answer:

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28. CaC_2 reacts with water to give:

A. Methane

B. Ethane

C. Ethylene

D. Acetylene

Answer:

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29. Plaster of paris is

A. $CaSO_4 \cdot \left(\frac{1}{2}\right) H_2O$

B. $CaSO_4 \cdot 2H_2o$

C. $CaSO_4 \cdot CaCo_3$

D. $CaSO_4 \cdot 5H_2O$

Answer:

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30. Slaked lime is obtained when water is added to

A. $CaSO_4 \cdot \left(\frac{1}{2}\right) H_2O$

B. $CaCl_2$

C. CaO

D. $CaCO_3$

Answer:

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31. Which of the following alkali metals has the least melting point?

A. Na

B. K

C. Rb

D. Cs

Answer:

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32. A solid compound X on heating gives CO_2 gas and a residue. The residue mixed with water forms Y on passing an excess of CO_2 through Y in water a clear solution Z is obtained. On boiling Z compound X is reformed . The compound X is :

A. $Ca(HCO_3)_2$

B. $CaCO_3$

C. Na_2CO_3

D. K_2CO_3

Answer:

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33. The correct sequence of increasing covalent character is represented by

A. $LiCl < NaCl < NaCl_2$

B. $BeCl_2 < LiCl < NaCl$

C. $NaCl < LiCl < BeCl_2$

D. $BeCl_2 < NaCl < LiCl$

Answer:

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34. NaOH is prepared by the method

A. Down's cell

B. Castner Cell

C. Solvay process

D. Castner-Kellner cell

Answer:

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35. When washing soda is heated

A. CO is released

B. CO and CO_2 is released

C. `CO_2 is released

D. Water vapour is released

Answer:

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36. When K_2O is added to water, the solution is basic because it contains a significant concentration

A. $(O_2)^{-2}$

B. O^{-3}

C. OH^-

D. K^+

Answer:

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37. The heat of hydration is maximum for

A. Be^+2

B. Mg^+2

C. Ca^+2

D. Sn^+2

Answer:

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38. Questions carrying two marks : Why is LiF almost insoluble in water whereas LiCl is soluble not only in water but also in acetone?

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39. Questions carrying two marks : When caesium can be used in photoelectric cell while lithium cannot be?

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40. Explain, why lithium chloride has more covalent character than potassium chloride.

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41. Questions carrying two marks : Why is KO^2 paramagnetic?

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42. Questions carrying two marks :What happens when the following compounds are heated? Li_2CO^3

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43. Questions carrying two marks :What happens when the following compounds are heated? Na_2CO_3

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44. Questions carrying two marks :What happens when the following compounds are heated? $LiNO_3$

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45. Questions carrying two marks :What happens when the following compounds are heated? KNO_3

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46. Questions carrying two marks : Write balanced equations for reactions between: Na_2O_2 and water

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47. Questions carrying two marks : Write balanced equations for reactions between: `KO_2 and water

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48. How is `BeCl2 prepared ? What is its structure in solid state and vapour state?

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49. What is hydrolith ? How is it prepared?

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50. Questions carrying two marks : Beryllium and magnesium do not give colour flame whereas other alkaline earth metals do so,why?

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51. Questions carrying 2 marks : Addition of NaOH solution to a solution of $ZnCl_2$ produces a white precipitate which dissolves in excess of NaOH and forms soluble sodium zincate. Why?

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52. Questions carrying 2 marks : What is magnesia cement? Give its composition.

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53. Give chemical equations for the various reactions taking place during the manufacture of washing soda by Solvay's process. What are the raw materials used in this process? What is the by-product in this process?

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54. Chlorination of calcium hydroxide produces bleaching powder. Write its chemical equation.

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55. What happens when : Carbon dioxide gas is passed through an aqueous solution of sodium carbonate. Give chemical equations for the reactions involved.

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56. What happens when : Potassium carbonate is heated with milk of lime. Give chemical equations for the reactions involved.

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57. What happens when : Lithium nitrate is heated. Give chemical equations for the reactions involved.

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58. Explain why : Lithium on being heated in air mainly forms the monoxide and not peroxide.

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59. Explain why : K, Rb, and Cs, on being heated in the presence of excess supply of air form superoxides into oxides and peroxides.

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60. Why aqueous solution of Na_2CO_3 is alkaline.

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61. Give reasons for the following: In aqueous solution, Li^+ ion has lowest ionic mobility among all the alkali metals.

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62. Account for the following: LiCl has lower melting point than NaCl.

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63. NaCl has higher melting point that KCl.

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64. How would you distinguish between. $BeSO_4$ and $BaSO_4$

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65. How would you distinguish between. KNO_3 and $LiNO_3$

Watch Video Solution

66. How would you distinguish between. $NaHCO_3$ and Na_2CO_3

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67. Give reasons for the following: In aqueous solution, Li^+ ion has lowest ionic mobility among all the alkali metals.

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68. Account for the following: LiCl has lower melting point than NaCl.

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69. Nitrogen gas reacts with metal A at room temperature to form white solid B. B on reaction with pungent smell of gas C along with the formation of D. D is used as antacid. C reacts with HCl to give white precipitate of E. Find A to E and write balanced chemical equations.

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70. Give the main reasons for anomalous behaviors Be.

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71. Give the difference between Be and Mg.

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72. Name the gases produced when Be_2C and MgC_2 is treated with H_2O.

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73. Give 2 anomalous behaviour of Li.

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74. Give the main reasons for anomalous behaviors Li.

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75. Explain why sodium is less reactive than potassium.

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76. Why are alkali metals not found in nature ?

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77. Find out the oxidation state of sodium in

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78. Explain why is sodium less reactive than potassium.

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79. Compare the alkali metals and alkaline earth metals with respect to ionisation enthalpy

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80. Explain why can alkali and alkaline earth metals not be obtained by chemical reduction methods?

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81. Discuss why potassium and caesium are used in photoelectric cells.

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82. The E^0 for Cl_2/Cl^- is $+1.36$ for l_2/l^- is $+0.53$ for Ag^+/Ag is $+0.79$, Na^+/Na' is $-$ and Li^+/Li is -3.04 Arrange the following ionic species in decreasing order of reducing strength

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83. When an alkali metal dissolves in liquid ammonia the solution can acquire different colours. Explain the reasons for this type of colour change.

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84. Beryllium and magnesium do not give colour to flame whereas other alkaline earth metals do so. Why ?

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85. Discuss the various reactions that occur in the Solvay process.

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86. Comment on the reactions of dihydrogen with

chlorine,

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87. Comment on the reactions of dihydrogen with sodium.

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88. Comment on the reactions of dihydrogen with copper(II)oxide

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89. Would you expect the hydrides of N, O and F to have lower boiling points than the hydrides of their subsequent group members ? Give reasons.

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90. Can phosphorus with outer electronic configuration $3S^2 4p^3$ form PH_5 ?

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91. How many hydrogen-bonded water molecule(s) are associated in $CuSo_4 . 5H_2O$?

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92. Calculate the strength of 10 volume solution of hydrogen peroxide.

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93. The metallic lustre exhibited by sodium is explained by

A. Diffusion of sodium ions

B. Oscillation of loose electrons

C. Excitation of free protons

D. Existence of body - centered cubic lattice

Answer: B

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94. Alkali metals impart colour to Bunsen flame due to

A. The presence of one electron in their outermost orbital

B. Low ionization energies

C. Their softness

D. Their reducing nature

Answer: B

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95. On prolonged exposure to air, sodium finally changes to

A. Na_2CO_3

B. Na_2O

C. NaOH

D. $NaHCO_3$

Answer: A

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96. Which reaction below is explosive?

A. Lithium with water

B. Magnesium with water

C. Beryllium with water

D. Caesium with water

Answer: D

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97. Which hydroxide is most basic?

A. KOH

B. RbOH

C. NaOH

D. CsOH

Answer: D

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98. Which of the following alkali metal halides has the lowest lattice energy?

A. LiF

B. NaCl

C. KBr

D. Csl

Answer: D

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99. The [O-O] bond length in H_2O_2 is

A. Larger than expected

B. Smaller than expected

C. Equal to expected

D. None of the above

Answer: A

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100. A sample of "H_2O_2" is labelled as "11.2 V". What is the molarity ?

A. 0.5 M

B. 1 M

C. 5.6 M

D. 11.2 M

Answer: B

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101. Which of the following characterizes hard water ?

A. It is denser than soft water

B. It is salty in taste

C. It is hard to digest

D. It does not produce lather with soap

Answer: D

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102. The primary reason balloons are filled with helium instead of hydrogen is

A. Hydrogen is flammable

B. Hydrogen is toxic

C. Helium is lighter than hydrogen quickly

D. Hydrogen seeps through the balloon material too

Answer: A

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103. Lithopone is a mixture of

A. Barium sulphate and zinc sulphide

B. Barium sulphide and zinc sulphide

C. Calcium sulphate and zinc sulphide

D. Calcium sulphide and zinc sulphide

Answer: A

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104. If a standard solution of $NaOH$ is kept in open air for some hours -

A. a precipitate will form

B. strength of solution will decrease

C. the strength of solution will increase

D. the concentration of Na® ion in solution will remain same

Answer: C

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105. $CaCl_2$ is preferred over NaCl for clearing ice on roads particularly in very cold countries. This is because

A. $CaCl_2$ is less soluble in H_2O than NaCl

B. $CaCl_2$ is hygroscopic but NaCl is not

C. Eutectic mixture of $CaCl_2 / H_2O$ freezes at - $55^\circ C$ while that of NaCl/H2O freezes at-$18^\circ C$

D. NaCl makes the road slippery but $CaCl_2$ does not

Answer: D

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106. Calcium imide on hydrolysis gives gas (B) which on oxidation by bleaching powder gives gas (C). Gas (C) on reaction with magnesium give compound (D) which on hydrolysis gives again gas (B). Identify (B), (C) and (D)

A. NH_3, N_2, Mg_3N_2

B. N_2, NH_3, $MgNH$

C. N_2, N_2O_5, $Mg(NO_3)_2$

D. NH_3, NO_2, $Mg(NO_2)_2$

Answer: B

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107. Which of the following statement is false ?

A. The milk of magnesia used as antacid is chemically $MgO + MgCl_2$

B. Stability of alkali metal peroxides increases with increase in atomic number

C. Hydration energy of AgF is higher than its lattice energy

D. Anhydrous $MgCI_2$ cannot be prepared by direct heating of $MgCl_{2.6}H_2O$

Answer: B

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108. Nitrogen dioxide cannot be obtained from

A. $Cu(NO_3)_2$

B. $Hg(NO_3)_2$

C. $NaNO_3$

D. $AgNO_3$

Answer: A

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109. Among the alkaline earth metals, the element forming predominantly covalent compound is :

A. Ba

B. Sr

C. Ca

D. Be

Answer: C

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110. $CO + NaOH \xrightarrow[5-10atm]{200^\circ C} A \xrightarrow{Heat} B \xrightarrow{CaCl_2}$ white ppt A and B are

A. $NaHCO_3, Na_2CO_3$

B. HCOONa, COONa
COONa

C. $HCOONa, NaOH$

D. $NaHCO_3, NaOH$

Answer: C

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111. Sodium is heated in air at $350^\circ C$ to form X. X absorbs $C0_2$ and forms sodium carbonate and Y. Which of the following is Y ?

A. H_2

B. O_2

C. H_2O_2

D. O_3

Answer: D

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112. Low solubility of CsI in water is due to :

A. smaller hydration enthalpy of Cs^+.

B. smaller hydration enthalpy of I^-.

C. lower lattice enthalpy of its two ions.

D. (1) and (2) both.

Answer: D

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113. Select the correct statement.

A. Among the alkali metals, only lithium reacts with nitrogen directly to form nitride.

B. Among the alkali metal carbonates, Li_2CO_3 has the lowest thermal stability.

C. Among the alkali metal hydroxide, CsOH has the highest solubility in water

D. All of these.

Answer: D

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114. When Ionic hydrides react with water, the products are:

A. acidic solutions and hydrogen gas.

B. acidic solutions and hydrogen gas.

C. basic solutions and hydrogen gas.

D. basic solutions and oxygen gas.

Answer: B

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115. The stability of K_2O, K_2O_2 and KO_2 is in order $K_2O < K_2O_2 < KO_2$ This increasing stability as the size of anion ion increases is due to stabilisation of:

A. larger cations by smaller anions through lattice .energy effects.

B. larger cations by larger anions through lattice energy effects.

C. smaller cations by smaller anions through melting pointing.

D. smaller cations by larger anions through hydration energy effect.

Answer: C

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116. At higher temperature sodium metal reacts with alumina to give a sodium compound 'X'. 'X' is dissolved in water and then carbon dioxide

gas is passed through it, a compound 'V is formed. The compound 'X' and 'Y' are respectively:

A. Na_2O_2 and Na_2CO_3

B. Na_2O and Na_2CO_3

C. Na_2O_2 and $NaAlO_2$

D. $NaAlO_2$ and Na_2CO_3`

Answer: A

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117. Sodium is heated in air at $350^\circ C$ to form X. X absorbs $C0_2$ and forms sodium carbonate and Y. Which of the following is Y ?

A. Na_2O and O_2

B. Na_2O_2 and O_2

C. NaO_2 and O_2

D. Na_2O_2 and O_3

Answer: B

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118. Which of the following oxides is formed when potassium metal is burnt in excess air ?

A. KO_3

B. K_2O

C. K_2O_2

D. KO_2

Answer: D

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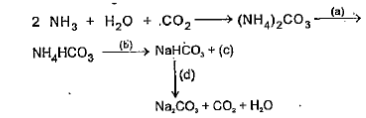
119. The following flow diagram represents the manufacturing of sodium carbonate ?



Which of the following option describes the underlined reagents, products and reaction conditions ?

Option	(a)	(b)	(c)	(d)
(A)	Carbon dioxide	NaCl	NH_4Cl	Heat
(B)	Carbon dioxide	NaCl	NH_4Cl	catalyst
(C)	Higher tempt.	NaCl	NH_4Cl	Heat
(D)	Higher pressure	NaCl	NH_4Cl	Catalyst

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120. Washing soda on heating :

A. releases carbon monoxide gas

B. releases carbon dioxide gas

C. both (1) and (2)

D. releases water vapours.

Answer: B

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121. The pair of amphoteric hydroxides is :

A. $Be(OH)_2, Al(OH)_3$

B. $Al(OH)_3, LiOH$

C. $B(OH)_3, Be(OH_2$

D. $Be(OH)_2, Mg(OH)_2$

Answer: C

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122. Gypsum on heating at a temperature' of 393 K yields :

A. calcium oxide

B. hemihydrate of calcium sulphate

C. anhydrous calcium sulphate

D. none of these.

Answer: B

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123. Which of the following statement is incorrect?

A. The effective component of bleaching powder is ocl^- .

B. $CaCO_3$ is obtained when quick lime is heated with coke in an electric furnace.

C. Anhydrous $CaSO_4$ is dead burnt plaster.

D. $BaCO_3$ is obtained on fusion of $BaSO_4$ and $Na_{22}CO_3$.

Answer: D

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124. A metal (M) burns with dazzling brilliance in air to give a white powder. The white powder reacts with water to form a white precipitate and a colourless gas with a characteristic smell. The metal (M) decomposes hot water but not cold water, liberating the inflammable hydrogen gas. The metal(M) is :

A. K

B. Ca

C. Mg

D. Rb

Answer: C

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125. Crude common salt becomes damp on keeping in air because :

A. It is hygroscopic in nature.

B. It contains $MgCI_2$ and $CaCl_2$ as impurities which are deliquescent in nature.

C. (1) and (2) both.

D. none

Answer: C

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126. Calcium cyanamide on reaction with steam under pressure gives ammonia and _____

A. calcium carbonate

B. calcium hydroxide

C. calcium oxide

D. calcium bicarbonate

Answer: D

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127. Which of the following two ions are closer to one another in size ?

A. Li^+ and Na^+

B. Be^{2+} and Mg^{2+}

C. Be^{2+} and Li^+

D. Li^+ and Mg^(2+)`

Answer: C

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128. The deep brown colour produced when iodine is dissolved in a solution of potassium iodide is caused by the presence of:

A. I_2

B. I^-

C. I_3^-

D. I_2^-

Answer: B

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129. In which of the properties listed below, hydrogen does not show similarity with halogens ?

Nature of the oxide

Electropositive character

Combination with alkali metals

Atomicity

A. I and II

B. III and IV

C. II only

D. I and IV

Answer: C

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130. In which of the following reactions does hydrogen act as an oxidising agent ?

A. $H_2 + F_2 \rightarrow$

B. $H_2 + SiCl_4 \rightarrow$

C. $Na + H_2 \rightarrow$

D. $CuO + H_2$

Answer: C

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131. When a substance A reacts with water, it produces a combustible gas B and a solution of substance C in water. D reacts with this solution of C and produces the same gas B on warming. D can also produce gas B on reaction with dilute H_2SO_4. A imparts a deep golden yellow colour to smokeless flame. A, B, C and D respectively are

A. $Na, H_2, NaOH, Zn$

B. k, H_2, KOH, Al

C. $Ca, H_2, Ca(OH)_2, Sn$

D. $CaC_2, C_2H_2, Ca(OH)_2, Fe$

Answer: B

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132. Mass percentage of deuterium in heavy water is

A. same as that of protium in water

B. 11.1

C. 20.0

D. cannot be predicted

Answer: C

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133. What is the degree of hardness of a sample of water containing 24 mg of $MgSO_4$ (molecular mass 120) per kg of water ?

A. 10 ppm

B. 15 ppm

C. 20 ppm

D. 25 ppm

Answer: B

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134. Polyphosphates are used as water softening agents because they

A. from soluble complexes with anionic species

B. precipitate anionic species

C. form soluble complexes with cationic species

D. precipitate cationic species

Answer: A

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135. An inorganic substance liberates oxygen on heating and turns an acidic solution of KI brown and reduces acidified $KMnO_4$ solution. The substance is

A. HgO

B. H_2O_2

C. KNO_3

D. $Pb(NO_3)_2$

Answer: A

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136. .The volume strength of $10NH_2O_2$ is

A. 112

B. 11.2

C. 0.112

D. 56

Answer: C

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

A. a blue colour is obtained in ether due to formation of $Cr_2(SO_4)_3$

B. a blue colour is obtained in ether due to formation of CrO_5

C. a blue colour is obtained in ether due to formation of CrO_3

D. chromyl chloride is formed

Answer: A

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138. Which one of the following reactions does not form gaseous product ?

A. $PbO_2 + H_2O_2 \rightarrow$

B. $PbS + H_2O_2 \rightarrow$

C. $Cl_2 + H_2O_2 \rightarrow$

D. $Na_2CO_3 + H_2O_2 \rightarrow$

Answer:

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139. Which is not s-block element ?

A. $[Ar]4s^2 3d^{10} 4p^6 5s^1$

B. $1s^2 2s^2 2p^1$

C. $[He]2s^2 2p^6 3s^1$

D. None of these

Answer: B

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140. Which of the following increases in magnitude as the atomic number of alkali metals increases?

A. Electronegativity

B. First ionisation potential

C. Ionic radius

D. Melting point

Answer: A

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141. Na and Li are placed in dry air. We get:

A. $NaOH, Na_2O, Li_2O$

B. Na_2O, Li_2O

C. $Na_2O, Li_2O, Li_3N, NH_3$

D. Na_2O, Li_3N, Li_2O

Answer: A

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142. The hydration energy of Mg^{2+} ion is higher than that of :

A. $Na^{\oplus}$

B. Ca^{2+}

C. Be^{2+}

D. None of these

Answer: B

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143. Which of the following has the highest melting point ?

A. NaCl

B. NaF

C. NaBr

D. Nal

Answer: C

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144. Which does not exist in solid state.

A. $NaHCO_3$

B. $NaHSO_3$

C. $LiHCO_3$

D. $CaCO_3$

Answer: D

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145. BeF_2 is soluble in water, whereas, the fluorides of other alkaline earth metals are insoluble because of:

A. ionic nature of BeF_2

B. greater hydration energy of Be^{2+} ion as compared to lattice energy

C. covalent nature of BeF_2

D. none of these

Answer: C

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146. Which of the following is the strongest base ?

A. $Ca(OH)_2$

B. $Sr(OH)_2$

C. $Ba(OH)_2$

D. $Mg(OH)_2$

Answer: D

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147. Heavy water is used in atomic reactor as

A. coolant

B. moderator

C. both coolant and moderator

D. neither coolant nor moderator

Answer: D

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148. The hardness of water sample containing 0.002 moles of magnesium sulphate dissolved in a litre is expressed as

A. 20 ppm

B. 200 ppm

C. 2000 ppm

D. 120 ppm

Answer:

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149. Which is //are not correct configuration of s- block elements :

A. $[Ar]3d^{10}4s^2$

B. $[Ar]3d^{10}4s^1$

C. $[Ar]4s^2$

D. $[Ar]4s^1$

Answer: A::B::C

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150. Alkali metals are characterised by their :

A. high electropositive character

B. high reduction potentials

C. low melting points

D. high solubility in liquid ammonia at -133^@C.`

Answer: A::B

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151. Which of the following statements is//are true ?

A. All alkail metals are soft and can be cut with knife.

B. Alkali metals do not occur in free slate in nature.

C. Alkali metals are highly electropositive elements.

D. Alkali metal hydrides are covalent and low melting solids.

Answer: A::B::C::D

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152. Select correct statements):

A. Li_2CO_3 is only sparingly soluble in water and no $LiHCO_3$ has been isolated.

B. K_2CO_3 cannot be made by a method similar to the ammonia - soda (Solvay) process. Obtained by Le-Blanc Process.

C. Li_2CO_3 and $MgCO_3$ both are thermally stable.

D. $Na_2CO_3.\ NaHCO_3.2H_2O$ is a mineral called trona.

Answer: A::C

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153. Select correct statements):

A. Stability of peroxides and superoxides of alkali metals increases with increase in size of the cation.

B. Increase in stability in (1) is due to stabilisation of large anions by larger cations through lattice energy effects.

C. The low solubility of LiF is due to its high lattice energy whereas low solubility of CsI is due to smaller hydration energy.

D. NaOH does not form hydrated salt.

Answer: A::B::C::D

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154. Which of the following statement(s) is//are correct ?

A. Sodium bicarbonate is more soluble than sodium carbonate.

B. Sodium hydroxide is used in the purification of bauxite.

C. Sodium bicarbonate is used as antacid and for making baking powder.

D. Potassium hydroxide is used in the manufacture of soft soaps.

Answer: A::B::C::D

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155. The pairs of compound which cannot exist together in aqueous solution are :

A. NA2CO3 and NaHCO3

B. NaHCO3 and NaOH

C. NaOH and NaH2PO4

D. Both B and C

Answer: A::C::D

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156. Flame test is not given by

A. Be

B. Mg

C. Ca

D. Sr

Answer: A::C::D

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157. Going down in II A group, following properties decrease:

A. solubility of sulphates in H_2O

B. hydration energy

C. thermal stability of carbonates

D. ionic radius in water.

Answer: A::B::C

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158. Which is/are true statements ?

A. The heats of hydration of the dipositive alkaline earth metal ions decrease with an increase in their ionic size.

B. Hydration of alkali metal ion is less than that of II A.

C. Alkaline earth metal ions, because of their much larger charge to radius ratio, exert a much stronger electrostatic attraction on the oxygen of water molecule surrounding them.

D. None.

Answer: C::D

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159. Alkali metals on combustion in excess of air form different type of oxides depending on the size of metal cations e.g . lithium forms mainly the oxide Li_2O, sodium forms peroxide and some super oxides NaO_2 and potassium, Rubidium and caesium form the superoxides, MO_2. The stability of peroxide and superoxide increases, as the size of the metal cation

increases because of the stabilisation of larger anion by larger cations through lattice energy effect. These oxides are easily hydrolysed by water. The oxides and the peroxides are colourless when pure, but the superoxides are yellow or orange in colour. Peroxide and superoxide of sodium and potassium are widely used as oxidising agent and as air purifier in space capsules, submarines and breathing mask. When sodium reacts with excess of oxygen at $350^\circ C$, the oxidation number of oxygen per atom changes from:

A. 0 to -1

B. 0 to $-\frac{1}{2}$

C. -1 to -2

D. $+1$ to -1

Answer: A

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160. Alkali metals on combustion in excess of air form different type of oxides depending on the size of metal cations e.g . lithium forms mainly the oxide Li_2O, sodium forms peroxide and some super oxides NaO_2 and potassium, Rubidium and caesium form the superoxides, MO_2. The stability of peroxide and superoxide increases, as the size of the metal cation

increases because of the stabilisation of larger anion by larger cations through lattice energy effect. These oxides are easily hydrolysed by water. The oxides and the peroxides are colourless when pure, but the

superoxides are yellow or orange in colour. Peroxide and superoxide of sodium and potassium are widely used as oxidising agent and as air purifier in space capsules, submarines and breathing mask. Which of the following compound is used in the emergency breathing apparatus ?

A. Potassium superoxide KO_2

B. Soda lime (NaOH + CaO)

C. Sodium monoxide (Na_2O)

D. Hydrated calcium sulphate $(CaSO_4.\ H_2O)$

Answer: B

Watch Video Solution

161. All alkali metals dissolve in anhydrous liquid ammonia to give blue colour solution. It is the ammoniated electron which is responsible for the blue colour of the solution, and the electrical conductivity is mainly due to ammoniated electron, $\left[e(NH_3)_y\right]^-$ Dilute solutions are paramagnetic due to free ammoniated electrons, this paramagnetism

decreases at higher concentration. Above 3M concentration, the solutions are diamagnetic and no longer blue but are bronze/copper-bronze coloured with a metallic luster. Which of the following statement about solution of alkali metals in liquid ammonia is correct ?

A. The dilute solutions are bad conductor of electricity

B. Both the dilute solutions as well as concentrated solution are equally paramagnetic in nature.

C. Charge transfer is responsible for the blue colour of the solution.

D. None of these.

Answer: C

View Text Solution

162. All alkali metals dissolve in anhydrous liquid ammonia to give blue colour solution. It is the ammoniated electron which is responsible for the blue colour of the solution, and the electrical conductivity is mainly due to ammoniated electron, $\left[e(NH_3)_y\right]^-$ Dilute solutions are

paramagnetic due to free ammoniated electrons, this paramagnetism decreases at higher concentration. Above 3M concentration, the solutions are diamagnetic and no longer blue but are bronze/copper-bronze coloured with a metallic luster. Ammoniated solutions of alkali metals are reducing agents due to the :

A. solvated cation.

B. solvated unpaired electron.

C. the liberation of hydrogen gas

D. (1) and (2) both

Answer: A

Watch Video Solution

163. Match Column-I with Column-II

	Column-I		Column-II
(A)	Solvay process	(P)	Na_2O
(B)	Evolve CO_2 on heating	(Q)	Na_2O_2
(C)	Aqueous solution is not neutral towards litmus	(R)	$NaHCO_3$
(D)	Used as air purifier in submarine	(S)	Na_2CO_3

Watch Video Solution

164. Match Column-I with Column-II

	Column-I		Column-II
(A)	Imparts colour to the Bunsen flame	(P)	$NaHCO_3$
(B)	Shows amphoteric character	(Q)	LiCl
(C)	Dissolves in water	(R)	$CaCO_3$
(D)	Evolves CO_2 on heating	(S)	$Be(OH)_2$

Watch Video Solution

165. Match Column-I with Column-II

	Column-I		Column-II
(A)	Washing soda	(P)	Forms suspension in water.
(B)	Slaked lime	(Q)	Readily soluble in solution of ammonium chloride (hot).
(C)	Milk of magnesia	(R)	Effloresces.
(D)	Gypsum	(S)	Does not impart characteristic colour to an oxidising flame.

Watch Video Solution

166. Match Column-I with Column-II

	Column-I		Column-II
(A)	Castner-kellner cell	(P)	Sodium hydroxide.
(B)	Solvay process	(Q)	Sodium sulphate.
(C)	Hargreaves process	(R)	Sodium carbonate.
(D)	Le-Blanc process	(S)	Potassium carbonate.

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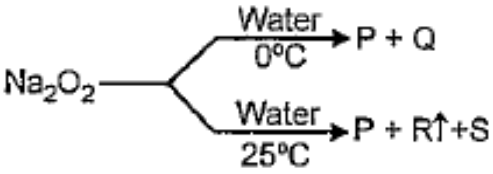
167. Complete the following reaction



Calculate sum of bond order between same bonded atoms in Q and R compounds.

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168. 'X volume" H_2O_2 solution has 15.15gm H_2O_2 in $1LH_2O_2$ solution what is 'x'?

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169. The reaction of NaOH with which of the following is a disproportionation reaction?

A. P

B. S

C. Cl2

D. All Of The Above

Answer: 3

Watch Video Solution

170. $Be(OH)_2$ is sparingly soluble in water , however soluble in excess NaOH. What is the coordination number of Beryllium in the soluble complex?

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171. $NaOH, KOH, Na_2CO_3, K_2CO_3$ are easily soluble in water while the corresponding salts of magnesium and calcium are sparingly soluble in water. Explain

Watch Video Solution

172. When an alkali metal dissolves in liquid ammonia, the solution can acquire different colours. Explain the reasons for this type of colour change

Watch Video Solution

173. Lil is more soluble than KI in ethanol - explain.

Watch Video Solution

174. Comparatively, size of $Li^{\oplus}$ ion is very small with' respect to other alkali meta) ions but it moves through a solution less rapidly than the others. Justify

Watch Video Solution

175. Discuss why on exposure to air, sodium hydroxide becomes liquid and after sometime it changes to white powder.

Watch Video Solution

176. Discuss how sodium cyanide can be prepared from metallic sodium.

Watch Video Solution

177. Discuss why potassium and caesium are used in photoelectric cells.

Watch Video Solution

178. Discuss the preparation of sodium by Castner's process

Watch Video Solution

179. Zn is placed above hydrogen in electrochemical series. It can replace hydrogen from acids. But, conc H_2SO_4, conc. HCI or Nitric acid are not preferred in the laboratory preparation of hydrogen from granular zinc. Why ?

Watch Video Solution

180. Comment on the structure of water molecule

Watch Video Solution

181. IE values of alkaline earth metals are

A. less than alkali metals

B. same as that of alkali metals

C. more than alkali metals

D. equal to zero group elements

Answer:

Watch Video Solution

182. The element which shows radioactivity is

A. Mg

B. Sr

C. Ba

D. Ra

Answer:

Watch Video Solution

183. Which of the following metal carbonates is decomposed on heating ?

A. Na_2CO_3

B. $MgCO_3$

C. K_2CO_3

D. Rb_2CO_3

Answer:

Watch Video Solution

184. When sodium is added in water,it catches fire. Name the gaseous product of combustion ?

A. N_2

B. H_2O

C. CO

D. H_2

Answer:

Watch Video Solution

185. Stable oxide is obtained by heating the carbonate of the element

A. Li

B. Na

C. K

D. Rb

Answer:

Watch Video Solution

186. The chloride that can be extracted with ether is

A. NaCl

B. KCl

C. LiCl

D. RbCl

Answer:

Watch Video Solution

187. Which of the following is the strongest base ?

A. $Ca(OH)_2$

B. $Sr(OH)_2$

C. $Ba(OH)_2$

D. $Mg(OH)_2$

Answer:

Watch Video Solution

188. Anhydrous $MgCl_2$ may be obtained by heating $MgCl_2.6H_2O$

A. until it fuses

B. with lime

C. with coal

D. in a current of dry HCl

Answer:

Watch Video Solution

189. Among the following hydroxides, the one which has the lowest value of Ksp at ordinary temperature is:

A. $Mg(OH)_2$

B. $Ca(OH)_2$

C. $Ba(OH)_2$

D. $Be(OH)_2$

Answer:

Watch Video Solution

190. Halides of alkaline earth metals form hydrates such as $MgCl_2.6H_2O, CaCl_2.6H_2O, BaCl_2.2H_2O$ and $SrCl_2.2H_2O$. This shows that halides of group 2 elements

A. are hygroscopic in nature

B. act as dehydrating agents

C. can absorb moisture from air

D. all of the above

Answer:

Watch Video Solution

191. Which of the following gives propyne on hydrolysis ?

A. Al_4C_3

B. Mg_2C_3

C. B_4C

D. La_4C_3

Answer:

Watch Video Solution

192. EDTA is used in the estimation of

A. Mg^{2+} ions

B. Ca^{2+} ions

C. both Ca^{2+} and $Mg(+2)$ ions

D. none of these

Answer:

Watch Video Solution

193. $Y \xleftarrow{\Delta, 205^\circ C} CaSO_{4.2}H_2O \xrightarrow{\Delta, 120^\circ C} X$. X and Y are respectively

A. plaster of paris, dead burnt plaster

B. dead burnt plaster, plaster of paris

C. CaO and plaster of paris

D. plaster of paris, mixture of gases

Answer:

Watch Video Solution

194. $BeCl_2 + LiAlH_4 \rightarrow X + LiCl + AlCl_3$

A. X is LiH

B. X is BeH_2

C. X is $BeCl_2.2H_2O$

D. none

Answer:

Watch Video Solution

195. The incorrect statement is

A. Mg cannot form complexes

B. Be can form complexes due to a very small atomic size

C. the first ionisation potential of Be is higher than that of Mg

D. Mg forms an alkaline hydroxide while Be forms amphoteric oxides

Answer:

Watch Video Solution

196. The order of solubility of lithium halides in non-polar solvents follow the order

A. $LiI > LiBr > LiCl > LiF$

B. $LiF > Lil > LiBr > LiCl$

C. $LiCl > LiF > LiI > LiBr$

D. $LiBr > LiCl > LiF > LiI$

Answer:

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197. A metal M readily forms water soluble sulphate, and water insoluble hydroxide $M(OH)_2$. Its oxide MO is amphoteric, hard and having high melting point. The alkaline earth metal M must be

A. Mg

B. Be

C. Ca

D. Sr

Answer:

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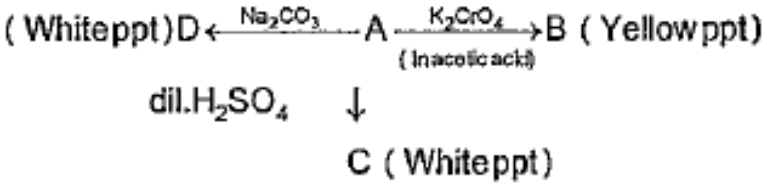

198.

If A is the metallic salt, them the white ppt. of D must be of

A. strontium carbonate

B. red lead

C. barium carbonate

D. calcium carbonate

Answer:

Watch Video Solution

199. A metal X on heating in nitrogen gas gives Y, Y on treatment with H_2O gives a colourless gas which then passed through $Cuso_4$ solution gives a blue colour. Y is

A. $Mg(NO_3)_2$

B. Mg_3N_2

C. NH_3

D. La_4C_3

Answer:

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200. Out of LiH, MgH_2 and CuH

A. All are ionic hydrides

B. LiH, MgH_2 are ionic and CuH is covalent

C. All are covalent

D. LiH, MgH_2 are ionic and CuH is intermediate hydride.

Answer:

Watch Video Solution

201. Under what conditions of temperature and pressure, the formation of atomic hydrogen from molecular hydrogen will be favoured most ?

A. high temperature and high pressure

B. low temperature and low pressure

C. high temperature and low pressure

D. high temperature and low pressure

Answer:

Watch Video Solution

202. $TiH_{1.73}$ is an example of

A. ionic hydride

B. covalent hydride

C. metallic hydride

D. polymeric hydride

Answer:

Watch Video Solution

203. The maximum possible number of hydrogen bonds a water molecule can form is

A. 1

B. 2

C. 3

D. 4

Answer:

Watch Video Solution

204. Water obtained by purification of organic ion exchange resins is :

A. deionised water

B. free from only $Ca(+2)$ and $Mg(+2)$

C. free fram HCO^{-3}, SO_4^{-2} and $Cl(-)$ ions only

D. none of these

Answer:

Watch Video Solution

205. In which of the following reactions does water act as an oxidising agent ?

A. $3F_2 + 3H_2O \rightarrow 6HF + O_3$

B. $CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$

C. $C + H_2O \rightarrow CO + H_2$

D. $AlN + 3H_2O \rightarrow Al(OH)_3 + NH_3$

Answer:

Watch Video Solution

206. Which of the following is not true ?

A. Ordinary water is electrolysed more rapidly than D_2O

B. D_2O freezes at lower temperature than H_2O

C. Reaction between H_2 and Cl_2 is much faster than D_2 and Cl_2

D. Bond dissociation energy for D_2 is greater than H_2

Answer:

Watch Video Solution

207. Which of the following is not correct regarding electrolytic preparation of H_2O_2?

A. lead is used as cathode

B. $50\ \%\ H_2SO_4$ is used.

C. hydrogen is liberated at anode.

D. sulphuric acid undergoes oxidation.

Answer:

Watch Video Solution

208. The hybridisation state and oxidation state of two oxygen atoms in H_2O_2 are respectively

A. $sp^2,\ -1$

B. $sp^2,\ +1$

C. $sp^3, \ -1$

D. $sp^3, \ +1$

Answer:

Watch Video Solution

209. Decolourisation of acidified potassium permanganate occurs when H_2O_2 is added to it. This is due to

A. oxidation of $KMnO_4$

B. reduction of $KMnO_4$

C. both oxidation and education of $KMnO_4$

D. none of these

Answer:

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210. Decomposition of H_2O_2 is accelerated by

A. traces of acids

B. acetanilide

C. finely divided metals

D. alcohol

Answer:

Watch Video Solution

211. An aqueous solution of hydrogen peroxide ions is

A. neutral

B. weakly acidic

C. alkaline

D. strongly acidic

Answer:

Watch Video Solution

212. The species that does not contain peroxide ions is

A. PbO_2

B. H_2O_2

C. SrO_2

D. BaO_2

Answer:

Watch Video Solution

213. When same amount of zinc is treated separately with excess of sulphuric acid and excess of sodium hydroxide solution, the ratio of volumes of hydrogen evolved is:

A. $1:1$

B. $1:2$

C. $2:1$

D. $9:4$

Answer:

Watch Video Solution

214. Chemical A is used for water softening to remove temporary hardness. A reacts with sodium carbonate to generate caustic soda. When CO_2 is bubbled through a solution of A, it turns cloudy. What is the chemical formula of A?

A. $CaCO_3$

B. CaO

C. $Ca(OH)_2$

D. $Ca(HCO_3)_2$

Answer:

Watch Video Solution

215. $H_2O_2 \rightarrow 2H^{\oplus} + O_2 + 2e^{-} = -0.68V$

The above equation represents which of the following behaviour of H_2O_2 ?

A. Reducing

B. Oxidising

C. Acidic

D. catalytic

Answer:

Watch Video Solution

216. In view of their ionisation energies, the alkali metals are

A. weak oxidising agents

B. strong reducing agents

C. strong oxidising agents

D. weak reducing agents

Answer:

Watch Video Solution

217. In certain matters, lithium differs from other alkali metals, the main reason for this is :

A. small size of lithium atom and Li^+ ion

B. extremely high electropositivity of Li

C. greater hardness of Li

D. hydration of Li^+ ion

Answer:

Watch Video Solution

218. Which one of the following electrolyte is used in Down's process of extracting sodium meta! ?

A. $NaCl + CaCl_2 + KF$

B. NaCl

C. $NaOH + KCl + KF$

D. $NaCl + NaOH$

Answer:

Watch Video Solution

219. Which salt on heating does not give brown coloured gas ?

A. $LiNO_3$

B. KNO_3

C. $Pb(NO_3)_2$

D. $AgNO_3$

Answer:

Watch Video Solution

220. The principal products obtained on heating iodine with concentrated caustic soda solution is :

A. $NaIO + NaI$

B. $NaIO + NaIO_3$

C. $NaIO_3 + NaI$

D. $NaIO_4 + NaI$

Answer:

Watch Video Solution

221. Washing soda has the formula :

A. Na_2CO_3

B. $Na_2CO_3.\ H_2O$

C. $Na_2CO_{3.7}H_2O$

D. $Na_2CO_{3.10}H_2O$

Answer:

Watch Video Solution

222. The right order of the solubility of sulphates of alkaline earth metals Is :

A. $Be > Ca > Mg > Ba > Sr$

B. $Mg > Be > Ba > Ca > Sr$

C. $Be > Mg > Ca > Sr > Ba$

D. $Mg > Ca > Ba > Be > Sr$

Answer:

Watch Video Solution

223. Compounds of alkaline earth metals are less soluble in water than the corresponding alkali metal salts due to:

A. their high ionisation energy

B. their low electronegativity

C. their low hydration energy

D. their high lattice energy

Answer:

Watch Video Solution

224. When zeolite which is hydrated sodium aluminium silicate, is treated with hard water, the sodium ions are exchanged with:

A. $H \oplus$ Ions

B. Ca^+2 ions

C. Mg^+2 ions

D. both Ca^+2 and Mg^+2 ions

Answer:

Watch Video Solution

225. In water :

A. temporary hardness is due to the bicarbonates of Ca^+2 and

`Mg^+2

B. permanent hardness is due to chlorides and sulphates of Ca^+ and

Mg^+2

C. hardness can be removed by adding phosphates.

D. none is correct.

Answer:

Watch Video Solution

226. Sodium sulphate is soluble in water but barium sulphate is sparingly soluble because :

A. the hydration energy of Na_2SO_4 is more than its lattice energy

B. lattice energy of $BaSO_4$ is more than its hydration energy the

C. the lattice energy has no role to play in solubility

D. the lattice energy of Na_2SO_4 is more than its hydration energy

Answer:

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227. Slaked lime, $Ca(OH)_2$ is used :

A. in the manufacture of sodium hydroxide.

B. in the manufacture of sodium hydroxide.

C. in the preparation of ammonia from ammonium salts.

D. in the detection of carbon dioxide gas.

Answer:

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228. Nitrate can be converted into metal oxide on heating not above $500^{o}C$ in case of:

A. Li

B. Na

C. Mg

D. None of these

Answer:

Watch Video Solution

229. Be and Al have following resemblance due to diagonal relationship :

A. have nearly equal electronegativity

B. form amphoteric oxides

C. have same charges/radius ratio

D. both form dimeric halides

Answer:

Watch Video Solution

230. Be and Al resemble in :

A. both become passive on reaction with HNO_3 due to formation of oxide layer.

B. their chlorides are Lewis acids.

C. chlorides exist in polymeric form.

D. hydroxides are soluble in alkali as well in acid.

Answer:

Watch Video Solution

231. Which of the following pairs of substances on reaction will evolve H_2 gas ?

A. Iron and dilute H_2SO_4

B. copper and dilute HCL

C. Sodium and ethyl alcohol

D. Iron and steam

Answer:

Watch Video Solution

232. Which of the following heated oxides are reduced by hydrogen ?

A. SnO_2

B. Al_2O_3

C. Fe_2O_3

D. CuO

Answer:

Watch Video Solution

233. Which of the following statements is/are correct?

A. Metallic hydrides are deficient in hydrogen

B. Metallic hydrides conduct heat and electricity

C. Ionic hydrides do not conduct electricity in solid state

D. Ionic hydrides are very good conductors of electricity in solid state

Answer:

Watch Video Solution

234. The oxide(s) which give(s) H_2O_2 on treatment with dilute acid is/are

A. PbO_2

B. MnO_2

C. Na_2O_2

D. BaO_2

Answer:

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235. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement - I: Lithium is the weakest reducing agent among the alkali metals.

Statement - II : In alkali metals, ionization energy decreases down the group.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -1

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

Watch Video Solution

236. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

Statements.

Statement- I: Caesium is used in photoelectric cells.

Statement - II : Caesium is most electropositive element.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -I

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -I.

C. Statement -I is true, Statement - II is false.

D. Statement -I is false, Statement - II is true.

Answer:

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237. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement - I : Superoxides of alkali metals are paramagnetic.

Statement - II: Superoxides contain the ion which has one unpaired electron.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -I

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -I.

C. Statement -I is true, Statement - II is false.

D. Statement -I is false, Statement - II is true.

Answer:

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238. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement - I : Beryllium does not impart any characteristic colour to the Bunsen flame.

Statement - II: Due to its very high ionization energy, beryllium requires a large amount of energy for excitation of the electrons.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -5

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

Watch Video Solution

239. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

Statements.

Statement - I: $BeCl_2$ fumes in moist air.

Statement - II: $BeCl_2$ reacts with moisture to form HCl gas.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -7

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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240. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement -1: $BeSO_4$ and $MgSO_4$ are soluble in water.

Statement - II : $BaSO_4$ is water insoluble because lattice energy of $BaSO_4$ is higher than its hydration energy.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -8

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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241. Assertion $BaCO_3$ is more soluble in HNO_3 than in plain water.

Reason Carbonate is a weak base and reacts with the H+ from the strong acid, causing the barium salt to dissociate.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -9

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

Watch Video Solution

242. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement -1 : As the very dilute solutions of alkali metals in liquid ammonia are made more concentrated, the molar conductivity at first decreases, reaching a minimum at about 0.05 molar, thereafter, it increases again.

Statement - II: The molar conductivity of the saturated solution of the alkali metals in liquid ammonia at -$33^{\circ} C$ is comparable to that of a metal.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -10

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

Watch Video Solution

243. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement - I : Solutions of alkali metals in liquid ammonia are good

reducing agents.

Statement - II: They contain free or solvated electrons

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -11

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

Watch Video Solution

244. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement -1: Solubilities of alkali metal fluorides and carbonates increase

down the group.

Statement - II : Hydration energies of alkali metal halides decrease down the group with increase in size of cations.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -12

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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245. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement -1: All alkali metals do not form superoxides as one of the main products in excess of air on heating.

Statement - II: Superoxide reacts with carbon monoxide producing a white powder and liberating dioxygen.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -13

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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246. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

Statements.

Statement -1 : $Na2SO_4$ can be used as the starting material for the preparation of sodium carbonate and sodium hydroxide

Statement - II: Sodium hydroxide is prepared by the treatment of milk of lime with sodium carbonate.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -14

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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247. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

15. Statement -1: Potassium carbonate can be prepared by Solvay process like sodium carbonate using potassium chloride as starting material.

Statement - II : Potassium carbonate is obtained as one of the products when potassium superoxide reacts with carbon dioxide.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -15

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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248. Assertion $BaCO_3$ is more soluble in HNO_3 than in plain water.

Reason Carbonate is a weak base and reacts with the H+ from the strong acid, causing the barium salt to dissociate.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -16

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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249. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two

Statements.

Statement -I : The crystalline salts of alkaline earth metals contain more water of crystallisation than the corresponding alkali metal salts.

Statement - II: Alkaline earth metals have smaller size and more nuclear charge.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -17

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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250. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement - I : Sodium bicarbonate generally precipitates normal carbonate from magnesium chloride solution.

Statement - II: Sodium carbonate generally precipitates basic carbonate from magnesium chloride solution.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -18

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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251. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement - I : The decahydrated form of sodium carbonate on standing in air effloresces.

Statement - II : It converts into monohydrate having formula, $Na_2CO_3.H_2O$.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -1

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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252. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement - I : Solution of sodium hydroxide can be stored in a vessel made of Zn or Al.

Statement - II : Sodium ferrite on treatment with hot water produces sodium hydroxide.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -20

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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253. This question has Statement I and Statement II. Of the four choices given after the Statements, choose the one that best describes the two Statements.

Statement -1: White precipitate of $BaSO_4$ is insoluble in water but readily dissolve iruthe solution of sodium salt of ethylenediaminetetra acetic acid (EDTA).

Statement - II : Ba^{2+} forms a- stable water soluble complex with the anion of the sodium salt of EDIA.

A. Statement - I is true.Statement - II is true, Statement - II is a correct explanation of Statement -21

B. Statement - I is true. Statement - II is true, Statement - II is not a correct explanation of Statement -1.

C. Statement -1 is true, Statement - II is false.

D. Statement -1 is false, Statement - II is true.

Answer:

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254. Alkali metal salts are water soluble and ionic in nature. Two factors such as lattice energy and hydration energy decide the extent of solubility. These two factors are opposing in nature solubility will be high if hydration energy is high. Higher will be the extent of hydration if size of the ion is smaller. Hydration of ions is exothermic process.Hydration energy also plays a role in deciding reducing power of alkali metals in solution.

Identify the strongest reducing agent among alkali metals in solutions

A. Li

B. Na

C. k

D. Cs

Answer:

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255. Alkali metal salts are water soluble and ionic in nature. Two factors such as lattice energy and hydration energy decide the extent of solubility. These two factors are opposing in nature solubility will be high if hydration energy is high. Higher will be the extent of hydration if size of the ion is smaller. Hydration of ions is exothermic process.Hydration energy also plays a role in deciding reducing power of alkali metals in solution.

Among the following the least soluble is

A. CsF

B. LiF

C. NaF

D. KF

Answer:

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256. Binary compounds of various elements with hydrogen where hydrogen exhibit an oxidation number of (-1) are called binary hydrides. Nature of hydride obtained depends upon electronegativity of the element and hence on the type of bond formed Hydrides are mainly of three classes

Ionic, saline or salt like hydrides.

Covalent or Molecular hydrides.

Metallic or interstitial hydrides.

Which of the following form metallic hydrides ?

A. Mn

B. Fe

C. Pb

D. Co

Answer:

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257. Binary compounds of various elements with hydrogen where hydrogen exhibit an oxidation number of (-1) are called binary hydrides. Nature of hydride obtained depends upon electronegativity of the element and hence on the type of bond formed Hydrides are mainly of three classes

Ionic, saline or salt like hydrides.

Covalent or Molecular hydrides.

Metallic or interstitial hydrides.

Which of the following is formed when LiH react with SO2?

A. $Li_2S_2O_4$ and H_2

B. Li_2S and H_2O

C. $Li + H_2SO_4$

D. $LiO + H_2S$

Answer:

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258. Match Column-I with Column-II

Column-I	Column-II
(A) KO_2	(P) Paramagnetic
(B) Li_2CO_3	(Q) Do not form alums
(C) Li_2SO_4	(R) Superoxide
(D) Sorel cement	(S) Thermally unstable
	(T) Dental filling

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259. Match Column-I with Column-II

Column-I	Column-II
(A) K_2CO_3	(P) a component of fusion mixture
(B) $LiClO_4 > NaClO_4$	(Q) Oxide of metal + NO_2 + O_2 as decomposition products
(C) $LiNO_3$	(R) Pearl ash
(D) LiCl	(S) Forms hydrated crystals
	(T) Solubility trend

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260. Match Column-I with Column-II

Column-I	Column-II
(A) Permutit	(P) Antichlor
(B) H_2O_2 solution	(Q) β-emitter
(C) Tritium	(R) $Na_2Al_2Si_2O_8.xH_2O$
(D) H_2O	(S) $\angle HOH = 104.5°$
	(T) water softener

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261. Match Column-I with Column-II

Column-I	Column-II
(A) Zn + dil . HNO_3	(P) H_2 gas evolved
(B) Zn + dil. H_2SO_4	(Q) sulphates
(C) Permanent hardness	(R) Chlorides
(D) $H_2S_2O_8$	(S) Electrolysis of 50% H_2SO_4
	(T) H_2 gas not evolved

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262. How many of the following oxides are paramagnetic ?

KO_2, K_2O, K_2O_2

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263. How many of the following substances are used as the raw materials in Solvay process ?

$Na_2SO_4. NaCl, NH_3, CaCO_3, CaCl_2, Ca(OH)_2, Na_2CO_3$

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264. In dead burnt plaster how many moles of water of crystallisation are present per mole of the molecule ?

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265. The concentration of H_2O_2 sample in $\% w/v$ which is labelled as '10V' H_2O_2 is _____

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266. The mass of H2 (in g) which would be obtained from 21g of hydrolith when it reacts with water is_____

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267. Which is the strongest reducing agent among alkali metals (in aq. solution) ?

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268. Does Mg impart characteristic colour to the flame?

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269. Why does a piece of burning Mg ribbon continues to burn in SO_2? Give the name of product.

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270. Hydrated magnesium chloride cannot be dehydrated by heating .Why ?

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271. Why pellets of potassium hydroxide become wet when exposed to air

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272. Lithium forms monoxide, sodium gives peroxide while the rest of the alkali metals form superoxide. Explain

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273. Name the process used in the manufacture of Na_2CO_3.

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274. How would you explain BaO is soluble but $BaSO_4$ is insoluble is water.

Watch Video Solution

275. How would you explain BaO is soluble but $BaSO_4$ is insoluble is water.

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276. How is BeC!2 prepared ? What is its structure in solid state and vapour state.

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277. Arrange the following in decreasing order of solubility in water.

$Be(OH)_2, Ca(OH)_2, Ba(OH)_2, Sr(OH)_2$

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278. Arrange the following in decreasing order of solubility in water.

$BaSO_4, MgSO_4, CaSO_4, SrSO_4$

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279. Contrast the action of heat on the following and explain your answer.

Na_2CO_3 and $CaCO_3$

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280. Contrast the action of heat on the following and explain your answer.

$MgCl_2.6H_2O$and $CaCl_2.6H_2O$

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281. Contrast the action of heat on the following and explain your answer.

$Ca(NO_3)_2$ and $NaNO_3$

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282. From the following statements regarding H_2O_2, choose the incorrect statement:

A. It decomposes on exposure to light

B. It has to be stored in plastic or wax lined glass bottles in dark

C. It has to be kept away from dust

D. It can act only as an oxidizing agent

Answer:

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283. Which one of the following alkaline earth metal sulphates has its hydration enthalpy greater than its lattice enthalpy ?

A. $BeSO_4$

B. $BaSO_4$

C. $SrSO_4$

D. $CaSO_4$

Answer:

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284. The decreasing order of basic character of K_2O, BaO, CaO and MgO is

A. $K_2O > BaO > CaO > MgO$

B. $K_2O > CaO > BaO > MgO$

C. $MgO > BaO > CaO > K_2O$

D. $MgO > CaO > BaO > K_2O$

Answer:

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285. Match the flame colours of the alkaline earth metal! salts in the Bunsen burner

(a) Calcium

(b) Strontium

(c) Barium

(P) brick red

(q) apple green

(r) crimson

A. $a-p, b-r, c-q$

B. $a-r, b-p, c-q$

C. $a-q, b-r, c-p$

D. $a-p, b-q, c-r$

Answer:

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286. On heating which of the following releases CO_2 most easily ?

A. K_2CO_3

B. Na_2CO_3

C. $MgCO_3$

D. $CaCO_3$

Answer:

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287. Commercial sample of H_2O_2 is labeled as 10V. Its $\%$ strength is nearly

A. 3

B. 6

C. 9

D. 12

Answer:

Watch Video Solution

288. 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:

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289. Which of the following will give $H_2(g)$ at cathode and $O_2(g)$ at anode on electrolysis using platinum electrodes?

A. Concentrated aqueous solution of NaCl

B. Molten NaCl

C. Dilute aqueous solution of NaCl

D. Solid NaCl

Answer:

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290. Solubility of which among the following substances in water increases slightly with rise in temperature?

A. Potassium bromide

B. Potassium chloride

C. Potassium nitrate

D. Sodium nitrate

Answer:

Watch Video Solution

291. Which one of the following metallic hydroxides does not dissolve in sodium hydroxide solution ?

A. $Zn(OH)_2$

B. $Al(OH)_3$

C. $Fe(OH)_3$

D. $Pb(OH)_2$

Answer:

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292. When sodium hydroxide reacts with sand, it form

A. sodium silicate

B. silicon oxide

C. silicon hydroxide

D. None of these

Answer:

Watch Video Solution

293. Sodium carbonate is manufactured by

A. Lowing process

B. Le -blanc process

C. Solvay process

D. Haber's process

Answer:

Watch Video Solution

294. Water glass is

A. Na_2SiO_3

B. Mg_2Si

C. $SiCl_4$

D. $Ca(H_2PO_4)_2$

Answer:

Watch Video Solution

295. Assertion $BaCO_3$ is more soluble in HNO_3 than in plain water.

Reason Carbonate is a weak base and reacts with the H+ from the strong acid, causing the barium salt to dissociate.

A. If both Assertion and Reason are true and reason is correct explanation of Assertion

B. if both Assertion and Reason are true but reason is not the correct explanation of Assertion

C. If Assertion is true but Reason is false

D. If both Assertion and Reason are false

Answer:

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296. Assertion Anhydrous BaO_2 is used for preparing H_2O_2. Reason hydrated BaO_2 is not available.

A. If both Assertion and Reason are true and reason is correct explanation of Assertion

B. if both Assertion and Reason are true but reason is not the correct explanation of Assertion

C. If Assertion is true but Reason is false

D. If both Assertion and Reason are false

Answer:

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297. The reagent commonly used to determine hardness of water titrimetrically is

A. oxalic acid

B. disodium salt of EDTA

C. sodium citrate

D. sodium thiosulphate

Answer:

Watch Video Solution

298. Ice floats on water because

A. its density is less than that of water

B. crystal structure of ice has empty space

C. Both of the above

D. None of the above

Answer:

Watch Video Solution

299. Which of the following process is used for the manufacture of H_2?

A. Hoope's process

B. Le-blance process

C. Lane's process

D. Carter's process

Answer:

Watch Video Solution

300. Which one of the following metallic hydroxides does not dissolve in sodium hydroxide solution ?

A. $Zn(OH)_2$

B. $Al(OH)_3$

C. $Fe(OH)_3$

D. $Pb(OH)_2$

Answer:

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301. The hardness of water is estimated by

A. distillation method

B. ED1A method

C. conductivity method

D. titrimentric method

Answer:

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302. Smallest among these species is

A. lithium

B. lithium ion

C. hydrogen

D. helium

Answer:

Watch Video Solution

303. The laboratory method for the preparation of H_2O_2 is by

A. H_2SO_4

B. NH_4HSO_4

C. $Na_2O_2 + H_2SO_4$

D. All of these

Answer:

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304. The moderator used in nuclear reactor is

A. TEL

B. D_2O

C. H_2O_2

D. R-O-R

Answer:

Watch Video Solution

305. The reaction between sodium and water can be made less vigorous by

A. adding a little alcohol

B. amalgamating sodium-

C. adding a little acetic acid

D. lowering the temperature

Answer:

Watch Video Solution

306. The decomposition temperature is the lowest for

A. $BeCO_3$

B. $MgCO_3$

C. $SrCO_3$

D. $BaCO_3$

Answer:

Watch Video Solution

307. The chief component of cement that has property of setting quickly and acquiring considerable strength within a few days is

A. Tricalcium silicate, $3CaO.\ SiO_2$

B. Dicalcium silicate $2CaO.\ SiO_2$

C. Tricalcium aluminate, $3CaO.\ AI_2O_3$

D. All of the above

Answer:

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308. Which one of the alkali metals, forms only, the normal oxide, M_2O on heating in air ?

A. Rb

B. K

C. Li

D. Na

Answer:

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309. The ease of adsorption of the hydrated alkali metal ions on an ion-exchange resins follows the order

A. $Li^+ < K^+ < Na^+ < Rb^+$

B. $Rb^+ < K^+ < Na^+ < Li^+$

C. $K^+ < Na^+ < Rb^+ < Li^+$

D. $Na^+ < Li^+ < K^+ < Rb^+$

Answer:

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310. Assertion CsI is least soluble of all caesium halides in water.Reason It is due to low hydration energy.

A. Both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. Both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion.

C. Assertion is true but Reason is false.

D. Both Assertion and Reason are false.

Answer:

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311. Assertion In alkaline medium, H_2O_2 reacts with potassium ferricyanide. Reason H_2O_2 is a strong reducing agent.

A. Both Assertion and Reason are true and the Reason is the correct explanation of the Assertion.

B. Both Assertion and Reason are true but the Reason is not the correct explanation of the Assertion.

C. Assertion is true but Reason is false.

D. Both Assertion and Reason are false.

Answer:

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312. On dissolving moderate amount of sodium metal in liquid NH3 at low temperature, which one of the following does not occur ?

A. Na^+ ions are formed in the solution.

B. Blue coloured solution is obtained.

C. Liquid NH_3 becomes good conductor of electricity

D. Liquid NH_3 remains diamagnetic

Answer:

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313. The normality of 20 volume hydrogen peroxide solution is

A. 3.57 N

B. 0.68 N

C. 5.60 N

D. 5.35 N

Answer:

Watch Video Solution

314. When zeolite is treated with hard water, the sodium ions are exchanged with

A. H^+ ions

B. H^+ and Ca^{2+} ions

C. OH^- and Mg^{2+} ions

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

Answer:

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315. Which one of the following is true ?

A. NaOH is used in the concentration of bauxite ore

B. NaOH is a primary standard in volumetric analysis.

C. NaOH is a primary standard in volumetric analysis.

D. NaOH solution does not react with Cl_2

Answer:

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316. The alkali halide that is soluble in pyridine is

(1) NaCl

(2) LiCl

(3) KCl

(4) CsI

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317. Which one of the following is present as an active ingredient in bleaching powder-for bleaching action ?

A. $CaCl_2$

B. $CaOCl_2$

C. $Ca(OCl)_2$

D. CaO_2Cl_2

Answer:

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318. Which of the following compounds has the lowest melting point ?

A. CaF_2

B. $CaCl_2$

C. $CaBr_2$

D. CaI_2

Answer:

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319. Hydrogen is prepared from H_2O by adding

A. Ca, which act as reducing agent.

B. Al, which acts as oxidising agent

C. Ag, which acts as reducing agent.

D. Au, which acts as oxidising agent.

Answer:

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320. Permanent hardness of water is due to the presence of

(1) bicarbonates of sodium and potassium

(2) bicarbonates of sodium and potassium

(3) chlorides and sulphates of calcium and matgnesium.

(4) bicarbonates of calcium and magnesium.

(5) phosphates of sodium and potassium

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321. Hydrogen peroxide in its reaction with KlO_4 and NH_2OH respectively, is acting as a

A. reducing agent, oxidising agent

B. reducing agent, reducing agent

C. oxidising agent, oxidising agent

D. oxidising agent, reducing agent

Answer:

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322. In which of the following reactions H_2O_2 acts as a reducing agent?

$H_2O_2 + 2H^+ + 2e^- \rightarrow 2H_2O$

$H_2O_2 - 2e^- \rightarrow O_2 + 2H^+$

$H_2O_2 + 2e^- \rightarrow 2OH^-$

$H_2O_2 + 2OH^- - 2e^- \rightarrow O_2 + 2H_2O$

A. (a),(b)

B. (c),(d)

C. (a),(c)

D. (b),(d)

Answer:

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323. The pair(s) of reagents that yield paramagnetic species is/are

A. Na and excess of NH_3

B. K and excess of O_2

C. Cu and dilute HNO_3

D. O_2 and 2-ethylanthraquinol

Answer:

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