CHEMISTRY

BOOKS - GRB CHEMISTRY (HINGLISH)

S BLOCK ELEMENTS

Straight Objective Type

1. Which of the following hydrated chlorides can not be converted into anhydrous chloride only by heating?

A. $MgCl_2.6H_2O$

B. $AlCl_3.6H_2O$

C. $SnCl_2.2H_2O$

D. All of these

Answer: D

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2. Hydration energy of the given ions follows the order.

A. $Li^+ > K^+ > Na^+ > Rb^+ > Cs^+$

B. $Cs^+ > Rb^+ > K^+ > Li^+$

C. $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$

D. $Na^+ > K^+ > Rb^+ > Cs^+ > Li^+$

Answer: C

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3. Cs^+ ions impart violet colour to Bunsen flame. This is due to the fact that the emitted radiations are of

A. high energy

B. lower frequencies

C. longer wavelengths

D. zero wave number

Answer: A

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4. A metal which is soluble in both water and liquid NH_3 separatley :

A. Cr

B. Mn

C. Ba

D. Al

Answer: C

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5. An alkaline earth metal gives a salt with chlorine which is sparingly soluble in water at room tempreture but fairly soluble in boiling water. It also forms a sulphate whose mixture with a sulphate of a transition metal is called 'lithopone' and is used as white pigment. the alkaline earth metal is

A. Ca

B. Mg

C. Ba

D. Sr

Answer: C

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6. When a substance A reacts with water it produces a combustible gas B and a solution of substance C in water. When another substance D reacts with this solution of C, it also produces the same gas B on warming but D can produce B on reaction with dilute sulphuric acid at room temperature. B on reaction with dilute sulphuric acid at room temperature. A imparts a golden yellow colour to a smokeless flame of Bunsen flame. A, B, C and D are respectively.

A. $Na, H_2, NaOH$ and Zn

B. K, H_2, KOH and Zn

C. $K, H_2, NaOH$ and Zn

D. $Ca, H_2O, Ca(OH)_2$ and Zn

Answer: A

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7. The hydroxide of alkaline earth metal, which has the lowest value of solubility product (K_{sp}) at normal temperature $(25^\circ C)$ is :

A. $Ca(OH)_2$

B. $Mg(OH)_2$

C. $Sr(OH)_2$

D. $Be(OH)_2$

Answer: D

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8. X gives green flame test. Then, X is :

A. $MgSO_4$

B. BaS_2O_3

C. $CuSO_4$

D. PbS_2O_3

Answer: B

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9. Which of the following carbonate of alkali metals has the least thermal stability ?

A. Li_2CO_3

B. K_2CO_3

C. $C_{S2}CO_3$

D. Na_2CO_3

Answer: A

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10. The 'milk of magnesia' used as an antacid is chemically:

A. $Mg(OH)_2$

B. MgO

C. $MgCl_2$

D. $MgO + MgCl_2$

Answer: A

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11. The alkali metals which form normal oxide, peroxides as well as super oxides are :

A. Na, Li

B. K, Li

C. Li, Cs

D. K, Rb

Answer: D

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12. $Mg_2C_3 + H_2O \rightarrow X$(organic compound).

Compound X is :

A. C_2H_2

B. CH_4

C. propyne

D. ethene

Answer: C

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13. The hydration energy of Mg^{2+} is :

A. more than that of Mg^{3+} ion

B. more than that of Mg^{3+} ion

C. more than that of Al^{3+} ion

D. more than that of Be^{2+} ion

Answer: B

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14. In curing cement plasters, water is sprinkled from time to time. This helps in

A. hydrating sand and gravel mixed with cement

B. converting sand into silicate

C. developing interlocking needle like crystal of hydrated silicates

D. Keeping it cool

Answer: C

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15. A solution of sodium metal in liquid ammonia is strongly reducing due to the presence of

A. solvated sodium ions

B. solvated hydrogen ions

C. sodium atoms or sodium hydroxide

D. solvated electrons

Answer: D

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16. The order of solubility of lithium halides in non-lolar solvents follows the order

A. $LiI > LiBr > LiCl > LiF$

B. $LiF > LiI > LiBr > LiCl$

C. $LiCl > LiF > LiI > LiBr$

D. $LiBr > LiCl > LiF > LiI$

Answer: A

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17. The salt which finds uses in qualitative inorganic analysis is

A. $CuSO_4.5H_2O \text{or} ZnSO_4.5H_2O$

B. $K_2SO_4.\ Al_2(SO_4)_3.24H_2O$

C. $Na(NH_4)HPO_4.4H_2O$

D. $FeSO_4.(NH_4)_2SO_4.6H_2O$

Answer: C

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18. Fire extinguishers contain :

A. conc.H_2SO_4 solution

B. H_2SO_4 and $NaHCO_3$ solutions

C. $NaHCO_3$ solution

D. $CaCO_3$ solution

Answer: B

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19. $CsBr_3$ contains

A. $Cs - Br$ covalent bonds

B. Cs^{3+} and Br^- ions

C. Cs^+ and Br_3^- ions

D. Cs^{3+} and Br_3^{3-} ions

Answer: C

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20. $Na + Al_2O_3 \xrightarrow{\text{High temp.}} X \xrightarrow[\text{water}]{CO_2 \text{ in}} Y,$ compound is

A. $NaAlO_2$

B. $NaHCO_3$

C. Na_2CO_3

D. Na_2O_2

Answer: C

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21. The decreasing order of the second ionisation potential of K , Ca and Ba is

(At. No : K = 19 , Ca = 20 , Ba = 56)

A. $K > Ca > Ba$

B. $Ba > Ca > K$

C. $K > Ba > Ca$

D. $K = Ba = Ca$

Answer: A

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22. EDTA is used for the estimation of

A. Mg^{2+} ions

B. Ca^{2+} ions

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

D. Mg^{2+} ions but not Ca^{2+} ions

Answer: C

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23. $aq.\ NaOH + P_4(white) \rightarrow PH_3 + X,$ compound X is :

A. NaH_2PO_2

B. NaH_2PO_4

C. Na_2CO_3

D. $NaHCO_3$

Answer: A

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24. The correct order of solubility is

A. $CaCO_3 < KHCO_3 < NaHCO_3$

B. $KHCO_3 < CaCO_3 < NaHCO_3$

C. $NaHCO_3 < CaCO_3 < KHCO_3$

D. $CaCO_3 < NaHCO_3 < KHCO_3$

Answer: D

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25. The complex formation tendency of alkaline earth metals decreases down the group because :

A. atomic size increases

B. availability of empty d and f-orbitals increases

C. nuclear charge to valume ratio increases

D. all of the above

Answer: A

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26. The alkaline earth metals, which do not impart any colour to Bunsen flame are :

A. Be and Mg

B. Mg and Ca

C. Be and Ca

D. Be and Ba

Answer: A

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27. $Y \xrightarrow{\Delta, 250^\circ C} CaSO_4.2H_2O \xrightarrow{\Delta, 120^\circ C} X.$ 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: A

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28. 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: B

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29. When K_2O is added to water, the solution becomes basic in nature because it contains a significant concentration of :

A. K^+

B. O^{2-}

C. OH^-

D. O_2^{2-}

Answer: C

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30.

$$(\text{White ppt})D \xleftarrow[dil.H_2SO_4]{Na_2CO_3} A \underset{\text{C(White ppt)}}{\downarrow} \xrightarrow[\text{(in acetic acid)}]{K_2CrO_4} B(\text{Yellow ppt})$$

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

A. strontium carbonate

B. red lead

C. barium carbonate

D. calcium carbonate

Answer: C

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31. (Milky cloud)$C \xleftarrow{CO_2} A + Na_2CO_3 \rightarrow B + C$ The chemical formulae of A and B are :

A. $NaOH$ and $Ca(OH)_2$

B. $Ca(OH)_2$ and $NaOH$

C. $NaOH$ and CaO

D. CaO and $Ca(OH)_2$

Answer: B

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32. An aqueous solution of a halogen salt of potassium reacts with same halogen X_2 to give KX_3 a brown coloured solution, in which halogen exists as X_3^- ion X_2 as a Lewis acid and X^- as a Lewis base. Hgalogen X si :

A. chlorine

B. bromine

C. iodine

D. fluorine

Answer: C

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33. The correct order of basic-strength of oxides of alkaline earth metals is :

A. $BeO > MgO > CaO > SrO$

B. $SrO > CaO > MgO > BeO$

C. $BeO > CaO > MgO > SrO$

D. $SrO > MgO > CaO > BeO$

Answer: B

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34. The order of melting point of chlorides of alkali matals is

A. $LiCl > NaCl > KCl < CsCl$

B. $LiCl > NaCl > CsCl > KCl$

C. $NaCl > KCl > CsCl > LiCl$

D. $LiCl > NaCl > CsCl > KCl$

Answer: C

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35. $NaOH(Solid) + C\infty verset(200^\circ C) \rightarrow X,$ product X is :

A. $NaHCO_3$

B. Na_2CO_3

C. $HCOONa$

D. H_2CO_3

Answer: C

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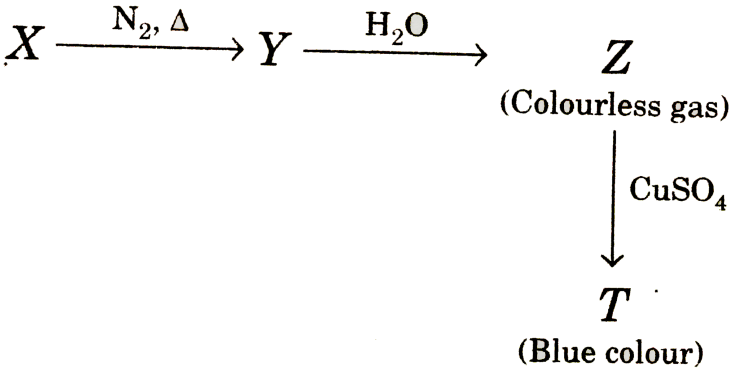
36.



Then, substances Y and T are :

A. $Y = Mg_3N_2$ and $T = CuSO_4.5H_2O$

B. $Y = Mg_3N_2$ and $T = CuSO_4.4NH_3$

C. $Y = Mg(NO_3)_2$ and $T = CuO$

D. $Y = MgO$ and $T = CuSO_4.4NH_3$

Answer: B

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37. Weakest base among KOH, NaOH, $Ca(OH)_2$ and $Zn(OH)_2$ is :

A. $Ca(OH)_2$

B. KOH

C. $NaOH$

D. $Zn(OH)_2$

Answer: D

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38. If X and Y are the second ionisation potentials of alkali and alkaline earth metals of same period, then :

A. $X > Y$

B. $X < Y$

C. $X = Y$

D. $Y = X$

Answer: A

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39. The aqueous solutions of lithium salts are poor conductor of electricity rather than other alkali metals because of:

A. high ionisation energy

B. high electronegativity

C. lower ability of Li^+ ion to polarize water molecules

D. higher degree of hydration of Li^+ ions

Answer: D

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40. Sodium metal is highly reactive and cannot be stored in :

A. toluene

B. kerosene oil

C. alcohol

D. benzene

Answer: C

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41. Nitrogen dioxide cannot be prepared by heating :

A. KNO_3

B. $AgNO_3$

C. $Pb(NO_3)_2$

D. $Cu(NO_3)_2$

Answer: A

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42. In $LiAlH_4$, metal Al is present in :

A. anionic part

B. cationic part

C. in both anionic and cationic part

D. neither in cationic nor in anionic part

Answer: A

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43. $X \xrightarrow{CoCl_2} CaCl_2 + Y \uparrow$, the effective ingredient of X is :

A. OCl^-

B. Cl^-

C. OCl^+

D. OCl_2^-

Answer: A

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44. Which one of the following fluoride of alkali metals has the highest lattice energy?

A. LiF

B. CsF

C. NaF

D. KF

Answer: A

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45. Crown ethers and cryptands form :

A. complexes with alkali metals

B. salts of alkali metals

C. hydroxides of alkali metals used for inorganic quantitative analysis

D. organic salts of alkali metals

Answer: A

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46. White heavy precipitates are formed when $BaCl_2$ is added to a clear solution of compound A. Precipitates are insoluble in dilute HCl. Then, the compound A is :

A. a bicarbonate

B. a carbonate

C. a sulphate

D. a chloride

Answer: C

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47. Amongst $LiCl, RbCl, BeCl_2$ and $MgCl_2$, the compounds whith the greatrest and the least ionic character respecitely are :

A. $MgCl_2$ and $BeCl_2$

B. $RbCl$ and $BeCl_2$

C. $RbCl$ and $MgCl_2$

D. $RbCl$ and $LiCl$

Answer: B

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48.

$$X + C + Cl_2 \xrightarrow[of\ \ about\ \ 1000\ \ K]{High\ \ temperature} Y + CO, Y + 2H_2O \rightarrow Z + 2HCl$$

Compound Y is found in polymeric chain structure and is an electron deficent molecule. Y must be :

A. BeO

B. $BeCl_2$

C. BeH_2

D. $AlCl_3$

Answer: B

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49. The correct order of degree of hydration of M^+ ions of alkali metals is :

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

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

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

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

Answer: C

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

A. $XisLiH$

B. $XisBeH_2$

C. $XisBeCl_2.2H_2O$

D. None of these

Answer: B

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51. The order of thermal stability of carbonates of IIA group is :

A. $BaCO_3 > SrCO_3 > CaCO_3 > MgCO_3$

B. $MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$

C. $CaCO_3 > SrCO_3 > BaCO_3 > MgCO_3$

D. $MgCO_3 = CaCO_3 > SrCO_3 > SrCO_3 = BaCO_3$

Answer: A

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52. A pair of substances which gives the same products on reaction with water is:

A. Mg and MgO

B. Sr and SrO

C. Ca and CaH_2

D. Be and BeO

Answer: C

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53. Which of the following is not an anomalous property of lithium?

A. Hydrated lithium ion is the largest among alkali metals

B. The melting and boiling points of lithium are comparatively high

C. Lithium is softer than that of other alkali metals

D. The ionisation potential and electronegativity of lithium are higher than those of other alkali metals

Answer: C

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54. The incorrect statement(s) is/are :

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: A

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55. The commercial method of preparation of potassium by reduction of molten KCl with metallic sodium at $850^\circ C$ is based on the fact that

A. potassium is solid and sodium distils off at 850° C

B. potassium being more volatile and distils of thus shifting the reaction forward

C. sodium is more reactive than potassium at 850° C

D. sodium has less affinity to chloride ions in the presence of potassium ion

Answer: B

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56. $Be_2C + H_2O \rightarrow BeO + X$

$CaC_2 + H_2O \rightarrow Ca(OH)_2 + Y,$

then X and Y are respectively :

A. CH_4, CH_4

B. CH_4, C_2H_6

C. CH_4, C_2H_2

D. C_2H_2, CH_4

Answer: C

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57. Which of the following groups of elements have properties that are most similar?

A. Na, K, Ca

B. Mg, Sr, Ba

C. Be, Al, Ca

D. Be, Ra, Cs

Answer: B

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58. $MgBr_2$ and MgI_2 are soluble in acetone because of

A. their ionic nature

B. their coordinate nature

C. their metallic nature

D. their covalent nature

Answer: D

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59. Which of the following is not the characteristic of barium?

A. It emits electrons on exposure to light

B. It is a silvery white metal

C. It forms $Ba(NO_3)_2$ which is used in preparation of green fire

D. Its ionization potential is lower than radium

Answer: A

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60. Sodium metal dissolves in liquid ammonia and forms a deep blue solution. The colour is due to absorption of light by :

A. sodium ions

B. ammoniated electrons

C. free electrons

D. ammoniated sodium ions

Answer: B

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61. The reaction that is least feasibile is :

A. $Li_2CO_3 \rightarrow Li_2O + CO_2$

B. $4Li + O_2 \rightarrow 2Li_2O$

C. $6Li + N_2 \rightarrow 2Li_3N$

D. $2C_6H_5C \equiv CH + 2Li \rightarrow 2C_6H_6C \equiv CLi + H_2$

Answer: A

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62. Which of the following hydride is not ionic?

A. CaH_2

B. BaH_2

C. SrH_2

D. BeH_2

Answer: D

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63. Crude common salt is hygroscopic because of impurities of:

A. $CaSO_4$ and $MgSO_4$

B. $CaCO_3$ and $MgCl_2$

C. $CaBr_2$ and $MgBr_2$

D. $Ca(HCO_3)_2$ and $Mg(HCO_3)_2$

Answer: B

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64. The stability order of oxide, peroxide and superoxide of alkali metal is:

A. normal oxide $>$ super oxide $>$ peroxide

B. normal oxide $>$ peroxide $>$ super oxide

C. super oxide $>$ peroxide $>$ normal oxide

D. peroxide $>$ normal oxide $>$ super oxide

Answer: B

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65. Which of the following compound is/are used for oxygenating the submarine or spaceshuttle?

A. Na_2O_2

B. KO_2

C. KO_3

D. All of these

Answer: D

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66. The reaction of sodium with water is highly exothermic the rate of reaction can be lowered by :

A. decreasing the temperature

B. mixing with alcohol

C. mixing with acetic acid

D. making an amalgam

Answer: D

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67. Which metal reacts most vigorously with water?

A. Ca

B. K

C. Mg

D. Na

Answer: B

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68. Which substance is the least soluble in H_2O?

A. K_2CO_3

B. $KHCO_3$

C. $Ca(HCO_3)_2$

D. $CaCO_3$

Answer: D

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69. Calcium hydride reacts with excess water to form :

A. CaO and H_2

B. $Ca(OH)_2$ and O_2

C. $Ca(OH)_2$ only

D. $Ca(OH)_2$ and H_2

Answer: D

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70. Which procedure is best to extinguish burning magnesium?

A. Add water to it

B. Blow nitrogen gas over it

C. Cover it with sand

D. Throw ice on it

Answer: C

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

A. $BaSO_4$

B. $SrSO_4$

C. $CaSO_4$

D. $BeSO_4$

Answer: D

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72. For which compound does the reaction,

$MCO_3(s) \rightarrow MO(s) + CO_2(g)$occur most readily ?

A. $BeCO_3$

B. $MgCO_3$

C. $CaCO_3$

D. $BaCO_3$

Answer: A

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73. Which substance is not paired correctly with its name?

A. Baking soda-potassium hydrogen tartrate

B. Chalk-calcium carbonate

C. Epsom salt-magnesium sulphate heptahydrate

D. Plaster of Paris-calcium sulphate hemihydrate

Answer: A

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74. Mixing which combination produces a gaseous product?

A. Solid ammonium nitrate and solid calcium hydroxide

B. Copper metal and 0.10 M hydrochloric acid

C. Solutions of barium hydroxide and 0.10 M sulphuric acid

D. Solutions of aluminum nitrate and sodium chloride

Answer: A

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75. Magnesium chloride dissovles in water to form :

A. hydrated $MgCl_2$ molecules

B. hydrated Mg^{2+} ions and hydrate Cl^- ions

C. hydrated Mg^{2+} ions and hydrated Cl_2^{2-} ions

D. Hydrated Mg atoms and hydrated Cl_2 molecules

Answer: B

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76. Which substance is used in self-contained breathing equipment because it absorbs exhaled CO_2 and H_2O and releases O_2 gas?

A. KO_2

B. Na_2O_2

C. $NaOH$

D. Li_2O

Answer: A

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77. Which substance is the primary component in stalactites and stalagmites in caves?

A. CaO

B. $CaCO_3$

C. $Ca(OH)_2$

D. $CaSO_4$

Answer: B

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78. Lithium ion batteries are now commonly used in rechargeable consumer electronic devices. The main reason lithium is used in these devices is because :

A. lithium has a lower electronegativity than nickel in common nickel-cadmium batteries

B. lithium batteries are not as toxic as common alkaline batteries

C. lithium batteries have a reduced risk of leakage of chemicals

D. lithium batteries achieve a greater amount of energy stored per unit mass than other common batteries

Answer: D

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79. Which calcium compound is not aapreciably more soluble in 0.1 M hydrochloric acid than it is in pure water?

A. Limestone, $CaCO_3$

B. Slaked lime, $Ca(OH)_2$

C. Gypsum, $CaSO_4.2H_2O$

D. Hydroxyapatite, $Ca_5(OH)(PO_4)_3$

Answer: C

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80. The compound which is not associated with Solvay ammonia process for the production of Na_2CO_3:

A. NH_4HCO_3

B. $NaHCO_3$

C. $NaCl$

D. $Na_2C_2O_4$

Answer: D

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81. Certain characteristics lithium differ from those of 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: A

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82. The ionic mobility of alkali metal ions in aqueous solution is maximum for:

A. K^+

B. Rb^+

C. Li^+

D. Na^+

Answer: B

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83. The products formed when an aqueous solution of $NaBr$ is electrolysed in a cell having inert electrodes are :

A. Na and Br_2

B. Na and O_2

C. H_2, Br_2 and $NaOH$

D. H_2 and O_2

Answer: C

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84. Which of the following statement is incorrect for Na_2O_2?

A. It absorbs CO_2

B. At room temperature it produces O_2 with water

C. It produces NO_2 with NH_3

D. It converts green solution of Cr^{+3} to yellow solution

Answer: C

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85. Which one of the following statements regarding helium is incorrect?

A. It is used to fill gas balloons instead of hydrogen because it is lighter and non-inflammable

B. It is used as a cryogenic agent for carrying out experiments at low temperatures

C. It is used to produce and sustain powerful superconducting magnets

D. It is used in gas-cooled nuclear reactors

Answer: C

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86. Sodium carbonate can be manufactured by Solvay's process but potassium carbonate cannot be prepared because :

A. K_2CO_3 is more soluble

B. K_2CO_3 is less soluble

C. $KHCO_3$ is more soluble than $NaHCO_3$

D. $KHCO_3$ is less soluble than $NaHCO_3$

Answer: C

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87. Both temporary and permanent hardness is removed on boiling with

A. $CO(OH)_2$

B. Na_2CO_3 (washing soda)

C. $CaCO_3$ (lime stone)`

D. CaO (quick lime)`

Answer: B

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88. Which of the following bicarbonate does not exist in solid state?

A. $LiHCO_3$

B. $NaHCO_3$

C. $KHCO_3$

D. $RbHCO_3$

Answer: A

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89. Which element will exhibit the photoelectric effect with light of the longest wavelength?

A. K

B. Rb

C. Mg

D. Ca

Answer: B

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90. Which is the longest lived isotope of Francium?

A. Fr^{223}

B. Fr^{222}

C. Fr^{224}

D. Fr^{225}

Answer: A

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91. All alkali metals have one valence electron, ns^1, outside the noble gas core except :

A. Na

B. Fr

C. Cs

D. None of these

Answer: D

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92. The atomic and ionic radii of alkali metals vary on moving down the group :

A. $Li > Na > K > Rb > Cs$

B. $Li > Na^+ > K^+ > Rb^+ > Cs^+$

C. $Li < Na < K > Rb > Cs$

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

Answer: D

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93. Existence of which hydrated salt is most likely?

A. $LiCl.2H_2O$

B. $NaCl.2H_2O$

C. $KCl.2H_2O$

D. $CsCl.2H_2O$

Answer: A

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94. Correct order of density fo alkali metals :

A. $Li > Na > K > Rb > Cs$

B. $Li < Na > K > Rb > Cs$

C. $Li < Na > K < Rb < Cs$

D. $Li > Na < K > Rb > Cs$

Answer: C

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95. Most thermally stable peroxide can be generated for which of the following alkali metals?

A. Li

B. Na

C. K

D. Cs

Answer: D

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96. Correct order of metallic radius for alkali metals should be :

A. $Li < Na < K < Rb < Cs$

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

C. $Li > Na > K > Rb > Cs$

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

Answer: A

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97. For which alkali metal, hydrogen gas is not necessarily liberated on reaction with water?

A. Li

B. Na

C. Cs

D. None of these

Answer: D

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98. Which alkali metal requires the highest temperature to react with dihydrogen to form an ionic hydride?

A. Li

B. Mg

C. Na

D. Cs

Answer: A

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99. The most powerful reducing agent among the following is:

A. Li

B. Na

C. Rb

D. Cs

Answer: A

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100. Which of the following data is essential to determine the reducing power of a metal?

A. $M(s) \rightarrow M(g)$ (sublimation ethalpy)

B. $M(g) \rightarrow M^+(g) + e^-$ (ionization enthalpy)

C. $M^+(g) + H_2O \rightarrow M^+(aq)$ (hydration enthalpy)

D. all of the above

Answer: D

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101. Given :

$E^{\circ}_{Cl_2|Cl^-} = +1.36\ V$ $\quad$ $E^{\circ}_{I_2|I^-} = +0.53\ V$

$E^{\circ}_{Ag^+|Ag} = +0.70\ V$ $\quad$ $E^{\circ}_{Na^+|Na} = -2.71\ V$

$E^{\circ}_{Li^+|Li} = -3.04\ V$

For the species : $I^-, Ag, Cl^-, Li, Na,$ choose the correct order of reducing strength :

A. $Li < Na < I^- < Ag < Cl^-$

B. $Li < Na < Ag < Cl^- < I^-$

C. $Li > Na > I^- > Ag > Cl^-$

D. $Li > Na > Ag > Cl^- > I^-$

Answer: C

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102. The blue colour of the solution (metal dissolved in liquid ammonia) is due to :

A. free electrons

B. paramagnetic nature of solution

C. ammoniated electrons

D. liberation of hydrogen from solution on standing

Answer: C

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103. With reference of the above question, if the solution above is concentrated, then :

A. blue colour remains as it is

B. blue colour changes to to bronze colour

C. solutions becomes completely diamagnetic

D. both (b) and (c)

Answer: B

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104. Which of the following are the uses of lithium?

A. Electrochemical cells

B. To make tetra ethyl lead

C. Liquid metal is used as a coolant in fast breed nuclear reactions

D. LiOH is used in manufacture of soft soap

Answer: A

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105. Which of the following are expected to be coloured?

A. K_2O

B. K_2O_2

C. KO_2

D. None of these

Answer: C

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106. Which lithium halide is soluble in ethanol, acetone, ethylacetate as well as pyridine?

A. LiF

B. LiCl

C. LiBr

D. LiI

Answer: B

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107. Which among the following is thermally least stable?

A. Li_2CO_3

B. Na_2CO_3

C. K_2CO_3

D. Cs_2CO_3

Answer: A

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108. In Solvay's process, NH_3 is recovered by :

A. $NH_3cl \xrightarrow{\Delta} NH_3 + HCl$

B. $2NH_4Cl + Ca(OH)_2 \rightarrow 2NH_3 + CaCl_2 + H_2O$

C. both (a) and (b)

D. none of the above

Answer: B

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109. $Na_2CO_3.10H_2O \xrightarrow{373K} Na_2CO_3.\ H_2O + 9H_2O$

$Na_2CO_3.\ H_2O \xrightarrow{>373K} Na_2CO_3.\ H_2O$

Choose the correct statement(s) :

A. $Na_2CO_3.\ H_2O$ is called soda ash

B. Na_2CO_3 solution is alkaline due to hydrolysis of Na^+

C. $Na_2CO_3.10H_2O$ is known as Glauber's salt

D. none of the above

Answer: D

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110. Pure sodium chloride is obtained by :

A. solar evaporation of sea water

B. crude salt is dissolved in minimum amount of water and filtered to remove insoluble impurities. Solution is then saturated with HCl gas

C. Solvay's process

D. Castner-Kellner's process

Answer: B

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111. Select the incorrect order for 1st ionization ethalpy :

A. $Ba > Ra$

B. $Mg > Ca$

C. $Ba > Sr$

D. $Ca > Sr$

Answer: A, C

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112. The best route for the preparation of BeF_2 is :

A. thermal decomposition of $(NH_4)_2BeF_4$

B. $BeO + C + F_2 \overset{600-800K}{\Longleftrightarrow} BeF_2 + CO$

C. $Be + F_2 \overset{HighT}{\longrightarrow} BeF_2$

D. all of the above

Answer: A

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113. Which element does not form hydride upon heating with hydrogen?

A. Be

B. Mg

C. Ca

D. Sr

Answer: A

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114. Choose the correct statement(s) :

A. Large reducing nature of Be is due to large hydration energy and large value of enthalpy of atomization

B. Alkaline earth metals dissolve in liquid ammonia to give deep blue-black solutions forming ammoniated ions

C. From the solutions of (b), ammoniates $\left[M(NH_3)_6\right]^{2+}$ can be recovered

D. all of the above

Answer: D

View Text Solution

115. Which reaction(s) reflect amphoteric nature of BeO?

A. $BeO + C + Cl_2 \overset{600-800K}{\longleftrightarrow} BeCl_2 + CO$

B. $Be(OH)_2 + 2HCl + 2H_2O \rightarrow \left[Be(OH)_4\right]Cl_2$

C. $Be(OH)_2 + 2OH^- \rightarrow \left[Be(OH)_4\right]^{2-}$

D. both (b) and (c)

Answer: D

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116. Which carbonate is most unstable and requires CO_2 atmosphere to be stored?

A. $BeCO_3$

B. $MgCO_3$

C. $SrCO_3$

D. $BaCO_3$

Answer: A

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117. .Which of the alkali metal is having least melting point?

A. Na

B. K

C. Rb

D. Cs

Answer: D

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118. Which is soluble both in water and acetone?

A. LiF

B. LiCl

C. both (a) and (b)

D. None of these

Answer: B

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119. The substance not likely to contain $CaCO_3$ is:

A. sea shells

B. dolomite

C. a marble statue

D. calcined gypsum

Answer: D

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120. One mole of magnesium nitride on reaction with an excess of water gives

A. two moles of HNO_3

B. two moles of Nh_3

C. 1 mole of NH_3

D. 1 mole of HNO_3

Answer: B

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121. Be and Al exhibit many properties which are similar. But the two elements differ in

A. exhibiting maximum covalency in compounds

B. forming polymeric hydrides

C. forming covlalent bonds

D. exhibiting amphoteric nature in their oxides

Answer: A

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122. What is the best description of the change that occurs when $Na_2O(s)$ is dissolved in water?

A. Oxidation number of sodium decreases

B. Oxide ion accepts sharing in a pair of electrons

C. Oxide ion donates a pair of electrons

D. Oxidation number of oxygen increases

Answer: C

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123. Which of the following on thermal decomposition yields a basic as wel as acidic oxide?

A. NH_4NO_3

B. $NaNO_3$

C. $KClO_3$

D. $CaCO_3$

Answer: D

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124. Based on lattice energy and other considerations which one of the following alkali metal chlorides is expected to have the highest melting point

A. RbCl

B. LiCl

C. KCl

D. NaCl

Answer: D

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125. The correct statement for the molecule csI_3 is .

A. It contains Cs^{3+} and I^- ions

B. It contains Cs^+, I^- and lattice I_2

C. It is a covalent molecule

D. It contains Cs^+ and I_3^- ions

Answer: D

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126. The commerical name for calcium oxide is :

A. quick lime

B. milk of lime

C. limestone

D. slaked lime

Answer: A

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127. The correct order of the solubility of alkaline- earth metal sulphates in water is :

A. $Mg < Sr < Ca < Ba$

B. $Mg < Ca < Sr < Ba$

C. $Mg > Ca > Sr > Ba$

D. $Mg > Sr > Ca > Ba$

Answer: C

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128. The main oxides formed on combustion of Li,Na and K in excess of air respectively are

A. Li_2O, Na_2O_2 and KO_2

B. Li_2O, Na_2O and KO_2

C. LiO_2, Na_2O_2 and K_2O

D. Li_2O_2, Na_2O_2 and KO_2

Answer: A

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129. The species that do not contain peroxide ions, is

A. PbO_2

B. H_2O_2

C. SrO_2

D. BaO_2

Answer: A

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130. The set representing the correct order of the first ionisation potential is

A. $K > Na > Li$

B. $Be > Mg > Ca$

C. $B > C > N$

D. $Ge > Si > C$

Answer: B

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Reasoning Type

1. Statement-1: In Castner-kellner cell Na^+ is reduced at mercury cathode.

Statement-2: Standard reduction potential of hydrogen is higher than sodium.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

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2. Statement-1: Potassium and caesium are used in photo-electric cells.

Statement-2: Potassium and caesium emit electrons on exposure to light above certain minimum frequency.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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3. Assertion : Berylium does not impart any characteristic colour to the Bunsen flame.

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

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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4. Statement-1: In fused state, calcium chloride cannot be used to dry alcohol or NH_3.

Statement-2: Anhy. $CaCl_2$ is not a good desiccant.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

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5. Assertion : Ionization energy of Be is almost the same as that of Al.

Reason : Best diagonal relation ship is shown between Be and Al.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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6. Assertion:- Beryllium halides dissolve in organic solvents

Reason:- Beryllium halides are inoic in character

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

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7. Assertion : $BeCl_2$ fumes in moist air.

Reason : $BeCl_2$ reacts with moisture to form HCl gas.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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8. Statement-1: Calcium carbide on hydrolysis gives methane.

Statement-2: Calcium carbide contains C_2^{2-} anion.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: D

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9. Statement-1: When CO_2 is passed through lime water, it first turns milky and then the solution beocmes clear when the passage of CO_2 is continued.

Statement-2: The milkiness is due to the formation of insoluble $CaCO_3$ which then changes to soluble $Ca(HCO_3)_2$ when excess of CO_2 is present.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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10. Statement-1: $MgCO_3$ is soluble in water when a current of CO_2 is passed.

Statement-2: The solubility of $MgCO_3$ is due to the formation of $Mg(HCO_3)_2$.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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11. Statement-1: Lithium's reaction with water is less vigorous than that of sodium.

Statement-2: : Lithium has small size and very high hydration energy.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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12. Statement-1: LiF and CsI have low solubility in water.

Statement-2: Both have high lattice enthalpy.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: C

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13. Statement-1: Solvay's process cannot be extended to the manufacture of K_2CO_3.

$KHCO_3$ is too soluble to be precipitated by the addition of NH_4HCO_3 to a saturated solution of KCl.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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14. Assertion (A): Alkali metals can form ionic hydrides which contain hydride ion, H^-.

Reason (R): The alkali metals have low EN. Their hydrides conduct electricity, when fused and liberate hydrogen at the anode.

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: A

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15. Statement I: Alkali metals dissolve in liquid ammonia to give blue solutions.

Statement II: Alkali metals in liquid ammonia give solvated species of the type $\left[M(NH_3)_n\right]^{\oplus}$ (M = alkali metals).

A. Statement-1 is True, Statement-2 is True. Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is NOT a correct explanation for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is False, Statement-2 is True.

Answer: B

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Multiple Objective Type

1. The correct statement is/are :

A. $BeCl_2$ is a covalent compound

B. $BeCl_2$ is an electron deficient molecule

C. $BeCl_2$ can form dimer

D. The hybrid state of Be in $BeCl_2$ is sp^2

Answer: A::B::C

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2. KO_2 finds use in oxygen cylinders used for space and submarines. The fact(s) related to such use of KO_2 is /are :

A. it produces O_2

B. it produces O_3

C. it absorbs CO_2

D. it absorbs both CO and CO_2

Answer: A::C

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3. The compound (s) which have $-O-O-$ bonds (s) is/are

A. BaO_2

B. Na_2O_2

C. CrO_5

D. Fe_2O_3

Answer: A::B::C

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4. Highly pure dilute solution of sodium in ammonia :

A. shows blue colouration due to solvated electrons

B. shows electrical conductivity due to both solvated electrons as well as solvated sodium ions

C. shows red colouration due to solvated electrons but a bad conductor of electricity

D. produces hydrogen gas or carbonate

Answer: A::B

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5. Which of the following compounds are paramagnetic in nature?

A. KO_2

B. K_2O_2

C. Na_2O_2

D. RbO_2

Answer: A::D

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6. Which of the following substance (s) is/are used in laboratory for drying purposes ?

A. Anhydrous P_2O_5

B. Graphite

C. Anhydrous $CaCl_2$

D. Na_3PO_4

Answer: A::C

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7. Which of the following statements are false?

A. $BeCl_2$ is a linear molecule in the vapour state but it is polymeric form in the solid state

B. Calcium hydride is called hydrolith

C. Carbides of both Be and Ca react with water to form acetylene

D. Oxides of both Be and Ca are are amphoteric

Answer: C::D

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8. Which of the following are ionic carbides ?

A. CaC_2

B. Al_4C_3

C. SiC

D. Be_2C

Answer: A::B::D

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9. Na_2SO_4 is water soluble but $BaSO_4$ is insoluble because :

A. the hydration energy of Na_2SO_4 is higher than that of its lattice energy

B. the hydration energy of Na_2SO_4 is less than that of its lattice energy

C. the hydration energy $BaSO_4$ is less than that of its lattice energy

D. the hydration energy of $BaSO_4$ is higher than that of its lattice energy

Answer: A::C

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10. The compounds(s) formed upon combustion of sodium metal in excess air is/are

A. Na_2O_2

B. Na_2O

C. NaO_2

D. $NaOH$

Answer: A::B

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11. In acidic medium, the reaction of H_2O_2 with potassium permanganate produces a compound in which the oxidation state of Mn is not?

A. 0

B. $+2$

C. $+3$

D. $+4$

Answer: A::C::D

View Text Solution

12. Select the correct statement(s) :

A. Clay and lime on strong heating produces a fused mass known as 'cement clinkers'

B. Melting point and boiling point of II A group elements are higher than that of corresponding I A group elements

C. Zeolite method is used to remove permanent hardness of water

D. $'Ba'$ is soluble in both water and liquid NH_3

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

View Text Solution

13. The superoxide O_2^- ion is stable only in presence of :

A. Na

B. K

C. Rb

D. Cs

Answer: B::C::D

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14. Oxidation state of K in KO_2 is same as that in :

A. KO_3

B. K_2O_2

C. K_2O

D. KOH

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

View Text Solution

15. Which of the following form nitride?

A. Li

B. Mg

C. Na

D. K

Answer: A::B

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16. On combustion in excess air, Li forms :

A. Li_2O

B. Li_2O_2

C. LiO_2

D. LiO_3

Answer: A::B

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17. On hydrolysis of Rubidium superoxide, which of the following products are formed?

A. RbOH

B. H_2O_2

C. O_2

D. H_2O

Answer: A::B::C

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18. Choose the correct order of enthalpy of formation, ΔH_f° for halides of alkali metals :

A. $NaF < KF < RbF < CsF$

B. $NaCl > KCl > RbCl > CsCl$

C. $NaBr > KBr > RbBr > CsBr$

D. $KF < KCl < KBr < KI$

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

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19. Which reaction is not feasible?

A. $HC \equiv CH + Li \rightarrow Li^{+}\bar{C} \equiv \bar{C}Li^{+} + H_2$

B. $4NaNO_3 \xrightarrow{\Delta} 2Na_2O_2 + 4NO_2 + O_2$

C. $LiCl + 2H_2O \rightarrow LiCl.2H_2O$

D. $MgCl_2 + 6H_2O \rightarrow MgCl_2.6H_2O$

Answer: A::B

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20. Which of the following reactions are involved in Solvay's process?

A. $2NH_3 + H_2O + CO_2 \rightarrow (NH_4)_2CO_3$

B. $(NH_4)_2CO_3 + H_2O + CO_2 \rightarrow 2NH_4HCO_3$

C. $NH_4HCO_3 + NaCl \rightarrow NH_4Cl + NaHCO_3$

D. $2NaHCO_3 \rightarrow Na_2CO_3 + CO_2 + H_2O$

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

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21. Which of the following may be a use of $Na_2CO_3.10H_2O$?

A. Water softening, laundering and cleaning

B. Manufacture of glass, soap, borax and caustic soda

C. Paper, paint and textile industry

D. An important laboratory reagent both in qualitative and quantitative analysis

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

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22. Crude sodium chloride contains :

A. Na_2SO_4

B. $CaSO_4$

C. $CaCl_2$

D. $MgCl_2$

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

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23. Choose the correct statement(s) :

A. Crystals of sodium hydroxide are deliquescent

B. Sodium amalgam is a heterogeneous alloy

C. $NaHCO_3$ is used as a mild antiseptic

D. $NaHCO_3$ is made by heating Na_2CO_3 in moist CO_2 atmosphere

Answer: A::B::C

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24. Which among the following are expected to form hydrates?

A. $MgCl_2$

B. $CaCl_2$

C. $LiCl$

D. KCl

Answer: A::B::C

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25. Choose the correct statement for $BeCl_2$:

A. In solid phase, it has a chain structure

B. In vapour phase, it tends to form a chloro bridged dimer

C. At temperatures of the order 1200 K, it forms monomer

D. It hydrolyses to give $Be(OH)_4^{2-}$ and HCl

Answer: A::B::C

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26. Choose the reaction which may be used in metallurgical extractions :

A. $CaO + P_4O_{10} \rightarrow 2Ca_3(PO_4)_2$

B. $2Ca(OH)_2 + 2Cl_2 \rightarrow CaCl_2 + Ca(Ocl)_2 + 2H_2O$

C. $CaO + SiO_2 \rightarrow CaSiO_3$

D. $CaCl_2 + Na_2CO_3 \rightarrow CaCO_3 + 2NaCl$

Answer: A::C

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27. Choose the correct statements :

A. Ionic mobility order :

$$Li^+_{(aq)} < Na^+_{(aq)} < Rb^+_{(aq)} < Cs^+_{(aq)}$$

B. E^0 for $M^{2+}_{aq} + 2e^- \rightarrow M(s)$

(Where M=Ca,Sr,Ba) is nearly constant

C. Sodium is found to be more useful than potassium

D. $BeSO_4$ is almost insoluble and BeO is soluble in water

Answer: A::B::C

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28. The compound(s) of alkaline earth metals, which are amphoteric in nature is/are :

A. BeO

B. MgO

C. $Be(OH)_2$

D. $Mg(OH)_2$

Answer: A::C

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29. The golden yellow colour associated with $NaCl$ to Bunsen flame be explained on the basis of

A. low ionisation potential of sodium

B. emission spectrum

C. photosensitivity of sodium

D. sublimation of metallic sodium of yellow vapours

Answer: A::B

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30. Which of the following orders are correct?

A. $AgCl > AgF$: Covalent character order

B. $Bao > BaF_2$: Melting point order

C. $BeF_2 > BaF_2$: Solubility order

D. $LiNO_3 < RbNO_3$: Theral stabnility order

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

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31. Which of the following statements are correct?

A. Mg is present in chlorophyll

B. Alkaline earth metals does not form super oxide

C. $NaHCO_3$ is known as baking soda

D. Permanent hardness of water is removed by boiling

Answer: A::B::C

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32. Which of the following carbides on hydrolysis does not form methane?

A. Be_2C

B. CaC_2

C. SrC_2

D. Mg_2C_3

Answer: B::C::D

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33. Select the incorrect order for given properties :

A. Thermal stability : $BaSO_4 > SrSO_4 > CaSO_4$

B. Solubility : $BaSO_4 > SrSO_4 > CaSO_4$

C. Thermal stability : $Li_2CO_3 < Na_2CO_2 < K_2CO_3$

D. Solubility : $Li_2CO_3 > Na_2CO_3 > K_2CO_3$

Answer: B::D

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Comprehension Type

1. $A \xrightarrow{\Delta} B(\text{oxide}) + CO_2 \qquad B + H_2O \rightarrow C$

$C + CO_2 \rightarrow A(\text{milky}) \qquad C + NH_4Cl \xrightarrow{\Delta} D(\text{gas})$

$D + H_2O + CO_2 \rightarrow E \qquad E + NaCl \rightarrow F$

$F \overset{\Delta}{N}a_2CO_3 + H_2O + CO_2$

A is

A. $Ca(HCO_3)_2$

B. $CaCO_3$

C. CaO

D. Na_2CO_3

Answer: B

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2. $A \xrightarrow{\Delta} B(\text{oxide}) + CO_2 \qquad B + H_2O \rightarrow C$

$C + CO_2 \rightarrow A(\text{milky}) \qquad C + NH_4Cl \xrightarrow{\Delta} D(\text{gas})$

$D + H_2O + CO_2 \rightarrow E \qquad E + NaCl \rightarrow F$

$F \overset{\Delta}{N}a_2CO_3 + H_2O + CO_2$

B and C are respectively

A. $CaO, Ca(OH)_2$

B. $Ca(OH)_2, CaCO_3$

C. $CaCO_3, Ca(OH)_2$

D. $Ca(OH)_2, CaO$

Answer: A

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3. $A \xrightarrow{\Delta} B(\text{oxide}) + CO_2 \qquad B + H_2O \rightarrow C$

$C + CO_2 \rightarrow A(\text{milky}) \qquad C + NH_4Cl \xrightarrow{\Delta} D(\text{gas})$

$D + H_2O + CO_2 \rightarrow E \qquad E + NaCl \rightarrow F$

$F \overset{\Delta}{N}a_2CO_3 + H_2O + CO_2$

D, E and F are

A. NH_3, NH_4Cl, NH_4HCO_3

B. $NH_3, NH_4HCO_3, NaHCO_3$

C. $NH_4HCO_3, Na_2CO_3, NAHCO_3$

D. none of the above

Answer: B

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4. Alkali metals readily react with oxyacids forming corresponding salts like $M_2CO_3, MHCO_3, MNO_3, M_2SO_4$ etc. with evolution of hydrogen. The also dissolve in liquid NH_3 but without the evolution of hydrogen. The colour of its dilute solution is blue but when it is heated and concentrated then is colour becomes bronze.

Among the nitrate the alkali metals which one can be decomposed to its oxide easily?

A. $NaNO_3$

B. KNO_3

C. $LiNO_3$

D. $RbNO_3$

Answer: C

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5. Among the carbonates of alkali metals which one has highest thermal stability ?

A. Cs_2CO_3

B. Rb_2CO_3

C. K_2CO_3

D. Na_2CO_3

Answer: A

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6. Which of the following statement about the sulphate of alkali metal is correct ?

A. Except Li_2SO_4 all sulphate of other alkali metals are soluble in water

B. All sulphates of alkali metals except lithium sulphate forms alum

C. The sulphates of alkali metals except lithium sulphate do not decompose at high temperature

D. All of the above

Answer: D

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7. Which of the following about solution If alkali metals in lioquid ammonia is correct ?

A. The solution have strong oxidizing properties.

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

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

D. none of the above

Answer: B

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8. Alkali metals readily react with oxyacids forming corresponding salts like $M_2CO_3, MHCO_3, MNO_3, M_2SO_4$ etc. with evolution of hydrogen. This also dissolve in liquid NH_3 but without the evolution of hydrogen. The colour of its dilute solution is blue but when it is heated and concentrated then is colour becomes bronze.

Which metal bicarbonate does not exist in solid state?

(P) $LiHCO_3$ (Q) $Ca(HCO_3)_2$

(R) $Zn(HCO_3)_2$ (S) $NaHCO_3$

(T) $AgHCO_3$

A. P,Q,R and T

B. P,Q and R

C. P,Q and T

D. Q,R and S

Answer: A

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Match The Column Type

1. Match the following columns

Column-I		Column-II	
(a)	Gypsum	(p)	$CaSO_4 \cdot \frac{1}{2} H_2O$
(b)	Plaster of Paris	(q)	$2CaSO_4 \cdot H_2O$
(c)	Dead burnt plaster	(r)	$CaSO_4 \cdot 2H_2O$
(d)	Milk of lime	(s)	$CaSO_4$
		(t)	$Ca(OH)_2$

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2. Match the following columns

Column-I		Column-II	
(a)	Hydrolith	(p)	Contains Ca
(b)	Nitrolium	(q)	Used as fertilizer
(c)	Dolomite	(r)	Used to prepare H_2
(d)	Pearl's ash	(s)	Contains potassium

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3.

Column-I		Column-II	
(a)	Metal sulphate $\xrightarrow{\Delta}$ metal oxide + $SO_2 + O_2$	(p)	Ba
(b)	Metal cation + $K_2CrO_4 \longrightarrow$ yellow ppt.	(q)	Sr
(c)	Metal + $NH_3 \xrightarrow{\text{liquid}}$ blue solution	(r)	Na
(d)	MCl_2 + conc. $H_2SO_4 \longrightarrow$ white ppt.	(s)	Mg

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4. Match the following columns

List-I		List-II	
(a)	CaH_2	(p)	Paramagnetic anion
(b)	K_2O_2	(q)	Homodiatomic, diamagnetic anion
(c)	KO_2	(r)	Neutral aqueous solution
(d)	NaCl	(s)	Gives hydrogen on hydrolysis

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5. Match the following columns

Column-I		Column-II	
(a)	Solvay's process used for	(p)	NaCl
(b)	Evolve $CO_2\uparrow$ on heating	(q)	Na_2O_2
(c)	Aq. solution is neutral towards litmus	(r)	$NaHCO_3$
(d)	Oxone	(s)	Na_2CO_3

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Subjective Type

1. Amongst the following, the total number of compounds whose aqueous solution turns red litmus paper blue is:

KCN K_2SO_4 $(NH_4)_2C_2O_4$ $NaCI$
$ZN(NO_3)_2$ $FeCI_3$ K_2CO_3 NH_4NO_3
$LiCN$

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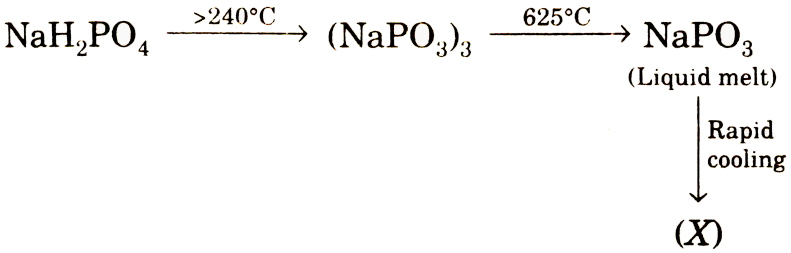

2.

Find the number of correct statements about (X)?

(a) X is cyclic hexametaphosphate $(Na_6P_6O_{18})$.

(b) X is widely used for softening water.

(c) X is long chain linear polyphosphate.

(d) X is soluble water.

(e) X is known as cyclic calgon.

(f) X is Graham salt.

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3. The number of alkali metal(s) capable of forming superoxide amongst (Li,Na,K) is:

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4. Find the number of compounds from the following in which the element in the anionic part is in the minimum oxiadation state of it :

$LiH, Mg_3Bi_2, Al_4C_3, Ca_3P_2, BaO_2$

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5. How many nitrate groups are present in 1 molecule of basic beryllium nitrate?

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6. Consider the following order :

(a) $CH_4 < CCl_4 < CF_4 : E.N.$ of central atom C

(b) $Mg^{2+} < K^{+} < S^{-2} < Se^{-2}$: Ionic radius

(c) $Be^{+2}_{(aq)} > Mg^{+2}_{(aq.)} > Ca^{+2}_{(aq)}$: Ionic mobility

(d) $Be^{+2} > Li^{+} > Al^{3+}$: Hydrated size

$Be > Li > Cs$: Reducing power

$Fe^{\Theta}_{(aq)} > Cl^{\Theta}_{(aq)} > Br^{\Theta}_{(aq)}$: Electrical conductance at infinite dilute solution Then calculate value of $|x - y|^2$, where x and y are correct and incorrect orders respectively.

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7. Consider the following elements :

Li, Cs, Mg, Pb, Al, N

X= number of elements which can form MO type of oxides.

y= the highest oxidation state shown by any one of them.

z=the number of elements which can form amphoteric oxides (s).

Find the sum of x,y and z.

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8. Find the number of s-block elements which can produce ammoniated cation and ammoniated electron with liquid ammonia.

Li, Na, K, Rb, Cs, Ca, Sr, Ba

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9. How many of the following metal chlorides impart characteristic colour to the lower oxidising flame?

LiCl, NaCl, KCl, $BeCl_2$, $MgCl_2$, $CaCl_2$, $SrCl_2$, $BaCl_2$

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