CHEMISTRY

BOOKS - BRILLIANT PUBLICATION

S-BLOCK ELEMENTS

Level I Homework

1. The alkali metal which is liquid at room temperature is

A. Na

B. Rb

C. K

D. Cs

Answer:

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2. Lithium is normally kept

A. in kerosene

B. in ethyl alcohol

C. wrapped in paraffin wax

D. in liquid ammonia

Answer:

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3. Which of the following is radioactive?

A. ^{23}Na

B. ^{39}K

C. ^{40}K

D. ^{37}Rb

Answer:

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4. Alkali metal/ion with highest standard oxidation potential is

A. Li^+

B. Na^+

C. Na

D. Li

Answer:

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5. Density of K, Na and Li respectively are respectively

A. 0.53, 0.86 and 0.97

B. 0.86, 0.97 and 0.53

C. 0.97, 0.86 and 0.53

D. 0.86, 0.53 and 0.97

Answer:

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6. When alkali metals are exposed to air get tarnished in air. This is due to

A. Formation of oxides

B. Formation of carbonates

C. Formation of hydroxides

D. All the above

Answer:

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7. The anomolous properties of lithium is not due to : exceptionally small size of Li^+ (76pm), its polarising power is the greatest of all alkali metals, increased covalent character of their compounds, least reactivity and hardness

A. exceptionally small size of Li^+ (76pm)

B. its polarising power is the greatest of all alkali metals

C. increased covalent character of their compounds

D. least reactivity and hardness

Answer:

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8. Which is not a point of diagonal similarity between Li & Mg? (1) Nitride formation, slow reaction with H2O (2) Action of heat on carbonates (3) Non-formation of solid bicarbonates (4) Both are not hard with least MP

A. Nitride formation, slow reaction with H_2O

B. action of heat on carbonates

C. non-formation of solid bicarbonates

D. both are not hard with least MP

Answer:

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9. The formula of Carnallite is

A. $KCl.\ MgCl.2H_2O$

B. $KCl.\ MgCl_2.6H_2O$

C. $K_2O.\ Al_2O.6H_2O$

D. $Na_2B_4O_7.10H_2O$

Answer:

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10. Which of the following is the stable nitride.

A. Li_3N

B. Na_3N

C. K_3N

D. Rb_3N

Answer:

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11. In the replacement reaction R3C-I + M-F -> R3C-F + M-I the reaction will be most favourable if M happens to be

A. Na

B. K

C. Rb

D. Li

Answer:

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12. Difference in hydration enthalpy is maximum for the pair

A. Li and Na

B. Na and K

C. K and Rb

D. Rb and Cs

Answer:

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13. The ease of adsorption of the hydrated alkali metal ions on an ion-exchange resins follows the order (1) L i + < K + < N a + < R b + (2) R b + < K + N a + < L I + (3) K + < N a + < R b + < L i + (4) N a + < L i + < K + < R b +

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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14. Alum is the name for all double salts having the composition $M_2^1 SO_4 M_2^{III}(SO_4)_3.24H_2O$, where M^{III} stands for Al^{3+}, Cr^{3+}, Fe^{3+} while M^I stands for

A. Li^+, Cu^+, Ag^+

B. Li^+, NH_4^+, Na^+

C. Na^+, K^+, Rb^+

D. $Ca^{2+}, Mg^{2+}, Sr^{2+}$

Answer:

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15. The Compound chemically known as Oxone is

A. Na_2O_2

B. Na_2O

C. $NaBO_2$

D. N_2O

Answer:

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16. The Salt used in the Bead test in qualitative inorganic analysis is

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

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

C. $CuSO_4.5H_2O$

D. $K_2SO_4.Al_2(SO_4)_3.24H_2O$

Answer:

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17. Which is incorrect pair?

A. $Na_2CO_3 + K_2CO_3$ – Fusion mixture

B. $NaCl + NaClO$-Bleaching mixture

C. $NaHCO_3 +$ Rochelle's Salt - Siedlitz powder (antiseptic)

D. $NaHCO_3 + \text{Dil.}H_2SO_4$ – Foamite oil fire extinguisher

Answer:

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18. Assertion : Potassium is not obtained by the electrolysis of fused KCl.

Reason : Potassium vapourises at the melting point of KCl

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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19. Assertion : Crude salt is dissolved in minimum amount of water and filtrate is saturated with HCl gas, $CaCl_2$ and $MgCl_2$ remains in solution while NaCl separates out.

Reason : Solubility of NaCl is more than that of $CaCl_2$ and $MgCl_2$

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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20. Assertion : K^+ and NH_4^+ ions have many similarities in their test.

Reason : Radius of K^+ is almost equal to NH_4^+

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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21. Which of the following is not regarded as alkaline earth metal

A. Be

B. Mg

C. Sr

D. Ra

Answer:

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22. Which of the following is Magnesite ore?

A. $MgCO_3$

B. $CaCO_3.\ MgCO_3$

C. $MgSO_4.7H_2O$

D. $MgSO_4.2H_2O$

Answer:

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23. Which of the following alkaline earth metal has least melting point?

A. Be

B. Mg

C. Ca

D. Sr

Answer:

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24. Diagonal similarity between Be & Al is not found in : no ready attack by acids, Beryliates & aluminates formation with alkali, from hydrated ions, strong tendency to form fluoro complex, produces Linear complexes

A. no ready attack by acids

B. Beryliates & aluminates formation with alkali

C. from hydrated ions, strong tendency to form fluoro complex

D. produces Linear complexes

Answer:

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25. Which statement is incorrect ? (1) Be exhibits coordination number six (2) Chlorides of both Be and Al have bridged structure in vapour phase (3)In alkali metals the reactivity increases but in halogens it decreases with increases in atomic number down the group (4) One mole of Mg3N2 when treated with excess of water give two moles of NH3

A. Be exhibits coordination number six

B. Chlorides of both Be annd Al have bridged structure in vapour phase

C. In alkali metals the reactivity increases but in halogens it decreases with increases in atomic number down the group

D. One mole of Mg_3N_2 when treated with excess of water give two moles of NH_3

Answer:

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26. Which of the following is used for producing neutrons?

A. Ra

B. Ba

C. Be

D. Sr

Answer:

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27. Both Be and Al when dipped in concentrated HNO_3 become passive because

A. non reacting nature of metals

B. non oxidising nature of acid.

C. The formation of an inert layer of the oxide on the surface of metals.

D. All are correct

Answer:

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28. Number of OH groups present in beryllate ion is

A. 4

B. 5

C. 6

D. 8

Answer:

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29. A heptahydrate of formula $\left[M(H_2O)_6\right]SO_4.H_2O$ is Isomorphous with white vitriol. The hydrated salt heated to $200^\circ C$ becomes anhydrous and when becomes red hot decomposed to its oxide SO_2 and O_2. The compound is needle shaped solid used as purgative. It can be Identified with Na_2HPO_4. Identify the salt?

A. Epsomite/Epsom salt

B. Nitrochalk

C. Anhydrone

D. microcosmic salt

Answer:

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30. When CaC_2 is heated with N_2 in an electric furnance, nitrolim is produced. Its composition is

A. $Ca(CN)_2$

B. Ca_3N_2

C. $CaNC_2$

D. $CaCN_2 + C$

Answer:

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31. $Ca(OH)_2 + CO_{2\,(\text{excess})} \rightarrow A$. Then A is

A. $CaCO_3$

B. $CaHCO_3$

C. $Ca(HCO_3)_2$

D. $CaOCl_2$

Answer:

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32. A white amorphous solid compound of Ca [X] with high MP of 2273K when exposed to oxyhydrogen flame becomes incandescent & prepared by a reversible reaction. It can absorb CO_2, SO_2 & moisture (DH=64.5kJ) and is a component of sodalime and the cheapest form of alkali & used in the purification of sugar. X is

A. quick lime/lime/burnt time

B. slaked lime

C. milk of lime

D. lime water

Answer:

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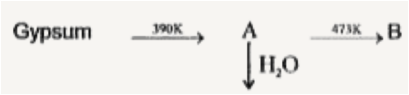
33. 

A and B are

A. plaster of paris, dead burnt plaster

B. orthorhombic gypsum, monoclinic gypsum

C. lime stone, Magnesia

D. sorel/magnesia cement, fluid magnesia

Answer:

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34. Which pair is incorrectly matched? (1)Cu-Be alloys - High strength springs (2) Metallic Be - Windows of X-ray tubes (3) Magnalium - Aircraft construction (4) Milk of Magnesla - Tooth paste

A. Cu-Be alloys - High strength springs

B. Metallic Be - Windows of X-ray tubes

C. Magnalium - Aircraft construction

D. Milk of Magnesla - Tooth paste

Answer:

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35. The species present in Chlorophyll and Grignard reagent is

A. Mg^{2+} and Mg

B. Mg and Mg^{2+}

C. Ca and Mg^{2+}

D. K and Mg

Answer:

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36. Nitrolim is a mixture of

A. Calcium carbide and graphite

B. Calcium cyanamide and graphite

C. Calcium carbide and nitrogen

D. Calcium cyanamide and nitrogen

Answer:

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37.

Element	Use
A	Radiotherapy
B	Windows of X-ray tube
C	flash produces and bulbs
D	Remove air from vaccum tubes

A, B, C, D respectively are

A. Ra, Be, Mg, Ca or Ba

B. Ra, Mg, Ca or Ba, Be

C. Ra, Cr or Ba, Mg, Be

D. Ra, Mg, Be, Ca or Ba

Answer:

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38. Assertion : A suspension of $Mg(OH)_2$ is used as lexative

Reason : It is an antacid (I) Both assertion and reason are true and reason is the correct explanation of assertion (II) Both assertion and reason are true and reason is not the correct explanation of assertion (III) Assertion is true and reason is false (IV) Both assertion and reason are false

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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39. Assertion : $Be(OH)_2$ dissovles in excess NaOH

Reason : $Be(OH)_2$ is an acidic compound

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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40. Assertion : SO_4^{2-} is estimated as $BaSO_4$, but not as $MgSO_4$

Reason : Ionic radius of Mg^{2+} is smaller than that of Ba^{2+}

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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Level Ii

1. Which of the following pair of alkali metals is more denser than water?

A. Li and K

B. K and Rb

C. Rb and Cs

D. Li and Rb

Answer:

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2. Reducing character of alkali metals of the order

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

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

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

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

Answer:

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3. Identify the correct statement about alkali metals

A. The alkali metals used as electrodes in photo electric cells impart crimson red or yellow colour to the flame

B. sodium D-line arises from the electronic transition $3s^1 \rightarrow 3d^1$ in sodium atoms formed in the flame

C. Rb on flame test shows absorption of radiation from shorter wavelength region than any other alkali metal

D. Alkali metals can be determined by flame photometry or atomic absorption spectroscopy

Answer:

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4. Which of the following alkali metal cation has large size in aqueous solution? (1) L i + (2) N a + (3) K + (4) R b +

A. Li^+

B. Na^+

C. K^+

D. Rb^+

Answer:

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5. Which of the following is not coloured when pure?

A. Li_2O

B. Na_2O_2

C. K_2O

D. KO_2

Answer:

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6. Which of the following is not obtained in the solid form? (1)L i H C O 3 (2) N a H C O 3 (3) R b H C O 3 (4) C s H C O 3

A. $LiHCO_3$

B. $NaHCO_3$

C. $RbHCO_3$

D. $CsHCO_3$

Answer:

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7. Which of the following alkali metal does not form alums?

A. Li

B. Na

C. Rb

D. Cs

Answer:

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8. Which of the following is thermally unsable hydroxyde? (1) LiOH (2) NaOH (3)RbOH (4)CsOH

A. LiOH

B. NaOH

C. RbOH

D. CsOH

Answer:

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9. Which of the following hydrides of alkali metal is more ionic?

A. NaH

B. KH

C. RbH

D. CsH

Answer:

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10. Identify the wrong statement about solubility of alkali metals in liquid ammonia

A. Irrespective of the alkali metal, the colour of the solution is blue

B. The density of the blue solution is less than that of liquid ammonia itself

C. As the concentration of metal increases, solvated electrons undergo a pairing process

D. Blue coloured solution is diamagnetic and bronze coloured solution is paramagnetic

Answer:

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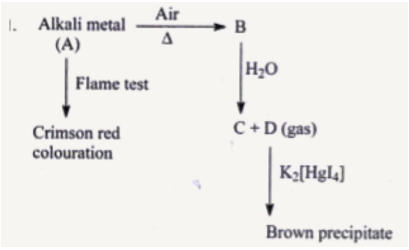
11.



B is

A. Li_2O

B. Li_3N

C. LiO_2

D. LiN_3

Answer:

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12. A compound of potassium A on hydrolysis generates B, C and oxygen gas. B is a strong base which acts as a good absorber of CO_2, compound C used to prevent decomposition of urea. Compound A, B and C are respectively

A. K_2O, KOH, O_3

B. K_2O, KOH, H_2O_2

C. KO_2, KOH, H_2O_2

D. KO_2, KOH, O_3

Answer:

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13. Cathode : $Na^{+} + 1e^{-} \xrightarrow{Hg} Na -$ amalgam

Anode : $Cl^{-} \rightarrow 1/2Cl_2 + e^{-}$

These electrode reactions represents the preparation of

A. NaOH - Electrolysis of NaCl

B. NaOH - Nelson Diaphragm cell

C. NaOH - Castner - Kellner cell

D. NaOH - Nafion membrane cell

Answer:

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14. The number of correct matchmaking pair from the following is

Glauber's salt - $Na_2SO_4.7H_2O$

Microcosmic salt - $Na(NH_4)HPO_4$

Oxone $-Na_2O_2$

Salt cake $-Na_2SO_4$

Pearl ash $-K_2CO_3$

A. 5

B. 4

C. 3

D. 2

Answer:

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15. Which of the following liquid alkali metal is used as a coolant in fast breeder nuclear reactors?

A. Li

B. Na

C. K

D. Rb

Answer:

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16. Assertion : LiF is more soluble than LiI in water

Reason : LiF is less covalent than LiI

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Assertion is false and reason is true

Answer:

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17. Assertion : On the addition of conc. HNO_3 to the aqueous solution of common salt, NaCl crystallises out

Reason : After the reaction between conc. HNO_3 and hydrated ions, the water molecules are removed and the ions are thus unsolvated. (I) Both assertion and reason are true and reason is the correct explanation of assertion (II) Both assertion and reason are true and reason is not the correct explanation of assertion (III) Assertion is true and reason is false (IV) Assertion is true and reason is false

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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18. Assertion : An aqueous solution of Na_2CO_3 is alkaline

Reason : Na_2CO_3 undergo hydrolysis to form Na_2O_2 and NaOH

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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19. Consider the following statements and arrange in the order of true or false

I) Group 2 elements are known as alkaline earth metal except Be

II) Be has the highest standard reduction potential among group 2 members

III) Mg burns with dazzling brilliance in air to give MgO and Mg $(NO_3)_2$

IV) Calcium and barium metals are used to remove air from vacuum tubes

(1) TTTT (2) FFFF (3) TTFT (4) TFFT

A. TTTT

B. FFFF

C. TTFT

D. TFFT

Answer:

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20. The solubility in water of sulphates down the group 2 is $Be > Mg > Ca > Sr > Ba$. This is due to

A. High heat of solvation form smaller ions like Be^{2+}

B. Increasing molecular weight

C. Decreasing lattice energy

D. Increase in melting point

Answer:

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21. The correct order of solubility in water of alkaline earth metal fluorides is

A. $BeF_2 < CaF_2 < SrF_2 < BaF_2$

B. $BeF_2 > CaF_2 > SrF_2 > BaF_2$

C. $CaF_2 < SrF_2 < BaF_2 < BeF_2$

D. $CaF_2 > SrF_2 < BaF_2 < BeF_2$

Answer:

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22. Magnesium nitrate crystalises with x molecules of water whereas barium nitrate crystallises with y molecules of water. Then x + y is

A. 4

B. 6

C. 12

D. 17

Answer:

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23. Themal decomposition of ammonium tetrafluoroberyllate gives X, heating Beryllium oxide with carbon and Cl_2 gas at 600-800 K gives Y and reduction of Y using is $LiAlH_4$ is Z. Then

I) X has electronegativity difference of 2.5 and exhibit covalent nature

II) Y shows acidic nature in water

III) The O-H bond strengthens in the hydrated ion formed on the hydrolysis of Y

IV) In Z, the oxidationi state of H is +1

A. I, II, III, IV are correct

B. I, II, III are correct

C. I, II are correct

D. I, III, IV are correct

Answer:

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24. 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:

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25. Which of the following on thermal decomposition yields a basic as well as acidic oxide?

A. $NaNO_3$

B. $KClO_3$

C. $CaCO_3$

D. $(NH_4)_2CO_3$

Answer:

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26. Which of the following statement is incorrect? (1) The effective component of bleaching powder is O C l − (2) C a C O 3 is obtained when quick lime is heated with coke in an electric furnance (3) Anhydrous C a S O 4 is dead burnt plaster (4) B a C O 3 is obtained on fusion of B a S O 4 and N a 2 C O 3

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

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

C. Anhydrous $CaSO_4$ is dead burnt plaster

D. $BaCO_3$ is obtained on fusion of $BaSO_4$ and Na_2CO_3

Answer:

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27. The chemical X is used

a) along with magnetite as a flux in the extraction of iron

b) In the manufacture of high quality paper

c) as mild abrasive in tooth paste

Then X is (1) CaO (2) C a C O 3 (3) C r (O H) 2 (4) C a O C l 2

A. CaO

B. $CaCO_3$

C. $Cr(OH)_2$

D. $CaOCl_2$

Answer:

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28. Identify the wrong statement from the following?

A. The residue obtained on heating gypum above 393 K contain two water molecules as water of crystallisation

B. The residue obtained on heating gypsum to 393 K, on mixing with an adequate quantity of water forms a plastic mass

C. Cement structures have to be cooled during setting by sprinkling water because setting of cement is an exothermic process

D. Gypsum combines with tricalcium aluminate to form calcium sulpho aluminate, which is the reaction slow down the setting.

Answer:

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29. Slaked lime is mixed with three to four times its weight of sand and the mixture is made into a thick paste (X) with gradual addition of water. X is used in building construction. Then X is

A. Concrete

B. Cement clinker

C. Mortar

D. Plaster of paris

Answer:

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30. Match column-I with column-II regarding the avergae composition of portland cement

Column-I (Material)	Column -II (Average composition%)
a) silica	p) 1.8%
b) Haematitte	q) 7%
c) Quick lime	r) 23%
d) Alumina	s) 56%

A. $a \to p, b \to s, c \to q, d \to r$

B. $a \to s, b \to p, c \to r, d \to a$

C. $a \to r, b \to c, c \to s, d \to q$

D. $a \to q, b \to p, c \to r, d \to s$

Answer:

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31. Milk of lime reacts with chlorine to form major components A and B. A in anhydrous form exhibit a bulk phenomenon and get hydrated while B holds chlorine atoms with their average oxidation state of zero. A and B are

A. $CaCO_3$ and CaOCl

B. $Ca(OH)_2$ and $CaOCl_2$

C. $CaCl_2$ and $CaOCl_2$

D. CaO and CaOCl

Answer:

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32. The order of decreasing concentration of important ingredients present in portland cement is

A. $Ca_3SiO_5 > Ca_2SiO_4 > Ca_3Al_2O_6$

B. $Ca_3SiO_5 > Ca_3Al_2O_6 > Ca_2SiO_4$

C. $Ca_3Al_2O_6 > Ca_3SiO_5 > Ca_2SiO_4$

D. $Ca_3Al_2O_6 > Ca_2SiO_4 > Ca_3SiO_5$

Answer:

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33.

List-I	List-II
a) $BeCl_2$(solid)	p) polymerise
b) BeH_2(solid)	q) sp^3 hybridisation
c) BeO (solid)	r) Amphoteric
d) MgO (solid)	s) Refractory material

Which of the above chemical shows only one matching with the properties indicated in list-II

A. $BeCl_2$

B. BeH_2

C. BeO

D. MgO

Answer:

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34. Assertion : Beryllium does not impart any characteristic colour to the Bunsen flame.

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

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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35. Assertion : In epsom salt, there are six water molecules are co-ordinated to Mg metal atom

Reason : In epsom salt, only two molecules of water are hydrogen bonded to SO_4^{2-} ion (I) Both assertion and reason are true and reason is the correct explanation of assertion (II) Both assertion and reason are true and reason is not the correct explanation of assertion (III) Assertion is true and reason is false (IV) Both assertion and reason are false

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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36. Assertion : Calcium concentration in plasma is regulated at about 100 mg L^{-1}, and it is maintained by calcitonin and parathyroid hormone.

Reason : The main roles of Ca are observed in the absorption of light in plants for photosynthesis and as a cofactor in the phosphate transfer of enzymes.

A. Both assertion and reason are true and reason is the correct explanation of assertion

B. Both assertion and reason are true and reason is not the correct explanation of assertion

C. Assertion is true and reason is false

D. Both assertion and reason are false

Answer:

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Level I

1. Property of alkaline earth metals that increases with their atomic number is

A. Ionization energy

B. Solubility of their hydroxides

C. Solubility of their sulphates

D. Electronegativity

Answer: B

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2. The solubilities of carbonates decrease down the magnesium group due to a decrease in

A. Entropy of solution formation

B. Lattice energies of solids

C. Hydration energies of cations

D. Interionic attraction

Answer: C

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3. Which of the following is acidic in nature?

A. $Be(OH)_2$

B. $Mg(OH)_2$

C. $B(OH)_3$

D. $Al(OH)_3$

Answer: C

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4. The alkaline earth metal which does not directly combine with hydrogen is

A. Be

B. Ca

C. Sr

D. Ba

Answer: A

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5. 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: B

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6. A solid compound of group I element and it gives a bright red colour in the flame test. The solid is

A. LiBr

B. CsCl

C. KCl

D. NaCl

Answer: A

Watch Video Solution

7. Prepartion of which of the following substance does not involve NaCl as its one step?

A. Na metal

B. NaOH

C. Na_2O_2

D. Na_2CO_3

Answer: D

Watch Video Solution

8. Alkali metals can be extracted from their salts by

A. Reduction with carbon

B. Electrolysis of aqueous solution of their halides

C. Electrolysis of fused halides

D. Reduction with aluminium

Answer: C

Watch Video Solution

9. In Down's process, for manufacture of sodium metal, $CaCl_2$ is added to NaCl in order to

A. Increase ionisation of NaCl

B. Increase the melting point of NaCl

C. Decrease the melting point of NaCl

D. Increase conductance of electrolyte

Answer: C

Watch Video Solution

10. Microcosmic salt is

A. $Na(NH_4)HPO_4.2H_2O$

B. $Na(NH_4).\ H_2O$

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

D. $K(NH_4)HPO_4.2H_2O$

Answer: A

Watch Video Solution

11. The similarity in the properties of alkali metals is due to

A. Their same atomicity

B. Similar outer shell configuration

C. Same energy of outer shell

D. Same principal quantum number of outer shell

Answer: B

Watch Video Solution

12. Which of the following decomposes on heating?

A. LiOH

B. NaOH

C. KOH

D. CsOH

Answer: A

Watch Video Solution

13. Among the alkali metals, the most abundant metal is

A. Na

B. K

C. Li

D. Cs

Answer: A

Watch Video Solution

14. Sodium thiosulphate, $Na_2S_2O_{3.5}H_2O$ is used in photography to

A. Reduce the AgBr grains to metallic Ag

B. Convert metallic Ag to Ag salt

C. Remove undecomposed AgBr as soluble silver thiosulphate complex

D. Removed reduced silver

Answer: C

Watch Video Solution

15. Saltpetre is

A. KNO_3

B. $NaNO_3$

C. NaCl

D. Na_2CO_3

Answer: A

Watch Video Solution

16. A pair of substances which cannot exist together in solution is

A. $NaHCO_3 + NaOH$

B. $NaHCO_3 + Na_2CO_3$

C. $Na_2CO_3 + NaOH$

D. NaOH + NaCl

Answer: A

Watch Video Solution

17. Magnesium uranyl test is used for

A. Sodium

B. Potassium

C. Rubidium

D. Caesium

Answer: A

Watch Video Solution

18. Lithia water used for the treatment of gout is

A. $LiHCO_3$

B. Li_2CO_3

C. Li_2SO_4

D. LiOH

Answer: A

Watch Video Solution

19. The stability of the following alkali metal chlorides follows the order:

A. $KCl > CsCl > NaCl > LiCl$

B. $LiCl > KCl > NaCl > CsCl$

C. $CsCl > KCl > NaCl > LiCl$

D. $NaCl > KCl > LiCl > CsCl$

Answer: A

Watch Video Solution

20. When a standard solution of NaOH is left in air for a few hours:

A. A precipitate will form

B. Strength will decrease

C. Strength will increase

D. The concentration of $Na^{\oplus}$ ions will remain constant

Answer: B

Watch Video Solution

21. Sodium hydride (NaH) when dissolved in water, produces

A. Acidic solution

B. Basic solution

C. Neutral solution

D. Cannot be predicted

Answer: B

Watch Video Solution

22. When sodium is added in scanty water, it catches fire. In this process which one of the following burns?

A. Na

B. H_2O

C. CO

D. H_2

Answer: D

Watch Video Solution

23. One of the natural minerals of sodium is tincal. Its formula is

A. $Na_2CO_{3.10}H_2O$

B. $NaNO_3$

C. $Na_2B_4O_7.\ 10H_2O$

D. NaCl

Answer: C

Watch Video Solution

24. The alkalimetals are low melting. Which of the following alkali metal is expected to melt if the room temperature rises to $30^\circ C$?

A. Na

B. K

C. Rb

D. Cs

Answer: D

Watch Video Solution

25. Dead burnt plaster is

A. $CaSO_4$

B. $CaSO_4.\ \frac{1}{2}H_2O$

C. $CaSO_4.\ H_2O$

D. $CaSO_{4.2}H_2O$

Answer: A

Watch Video Solution

26. The salt of an alkali metal gives yellow colour in the flame test. Also its aqueous solution gives an insoluble white precipitate with barium chloride in acid medium. The salt is

A. NaCl

B. K_2SO_4

C. Na_2SO_4

D. Li_2SO_4

Answer: C

Watch Video Solution

27. Sodium peroxide which is a yellow solid , when exposed to air becomes white due to the formation of

A. H_2O_2

B. Na_2O

C. Na_2O and O_3

D. NaOH and Na_2CO_3

Answer: D

Watch Video Solution

28. Which of the following statements is false regarding alkali metals? : Alkali metals are soft and can be cut with the help of knife., Alkali metals do not occur in free state in nature, Alkali metals are highly electropositive, Alkali metal hydrides are covalent in character

A. Alkali metals are soft and can be cut with the help of knife.

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

C. Alkali metals are highly electropositive

D. Alkali metal hydrides are covalent in character

Answer: D

Watch Video Solution

29. The alkali halide which is soluble in pyridine is

A. NaCl

B. LiCI

C. KCl

D. CsI

Answer: B

Watch Video Solution

30. The second ionisation enthalpy of which of the following alkaline earth metals is the highest ?

A. Ba

B. Mg

C. Ca

D. Be

Answer: D

Watch Video Solution

31. Which pair of the following chlorides do not impart colour to the flame ?

A. $BeCl_2$ and $SrCl_2$

B. $BeCl_2$ and $MgCl_2$

C. $CaCl_2$ and $BaCl_2$

D. $BaCl_2$ and $SrCl_2$

Answer: B

Watch Video Solution

32. Which 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

Watch Video Solution

33. Which of the following on thermal decomposition yields a basic as well as an acidic oxide?

A. $KClO_3$

B. $CaCO_3$

C. NH_4NO_3

D. Li_2CO_3

Answer: B

Watch Video Solution

34. Which one of the following represents the composition of camallite mineral?

A. $K_2O.\ Al_2O_3.6SiO_2$

B. KNO_3

C. $K_2SO_4.\ MgSO_4.\ MgCl_2.6H_2O$

D. $KCl.\ MgCl_2.6H_2O$

Answer: D

Watch Video Solution

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

A. $CaOCl_2$

B. $Ca(OCl)_2$

C. CaO_2Cl

D. $CaCl_2$

Answer: B

Watch Video Solution

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

A. converting sand into silicic acid

B. keeping it cool

C. developing interlocking needle like crystals of hydrated silicates

D. hydrating sand and gravel mixed with cement

Answer: C

Watch Video Solution

37. The alkali metal which acts as a nutrient for plants is:

A. Na

B. K

C. Li

D. Rb

Answer: B

Watch Video Solution

38. The raw materials in Solvay process are:

A. NaOH, CaO and NH_3

B. Na_2CO_3, $CaCO_3$ and NH_3

C. Na_2SO_4, $CaCO_3$ and NH_3

D. NaCl, NH_3CaCO_3

Answer: D

Watch Video Solution

39. Sodium thiosulphate is formed when:

A. NaOH is neutralised by H_2SO_4

B. Na_2S is boiled with S

C. Na_2SO_3 is boiled with Na_2S and I_2

D. Na_2SO_4 is boiled with Na_2S

Answer: C

Watch Video Solution

40. Magnesium metal is prepared by: reduction of MgO by coke, electrolysis of aqueous solution of $Mg(NO_3)_2$, displacement of Mg by iron from magnesium sulphate solution, electrolysis of molten magnesium chloride

A. reduction of MgO by coke

B. electrolysis of aqueous solution of $Mg(NO_3)_2$

C. displacement of Mg by iron from magnesium sulphate solution

D. electrolysis of molten magnesium chloride

Answer: D

Watch Video Solution

41. Portland cement does not contain

A. $CaSiO_4$

B. Ca_2SiO_5

C. $Ca_2Al_2O_6$

D. $Ca_3(PO_4)_2$

Answer: D

Watch Video Solution

42. Salt used as a purgative is:

A. NaCl

B. $MgSO_4.7H_2O$

C. $Ca_3Al_2O_6$

D. $MgCl_2.6H_2O$

Answer: B

Watch Video Solution

43. Superphosphate of lime is a mixture of: primary calcium phosphate and epsom, primary magnesium phosphate and epsom, primary magnesium phosphate and gypsum, primary calcium phosphate and gypsum

A. primary calcium phosphate and epsom

B. primary magnesium phosphate and epsom

C. primary magnesium phosphate and gypsum

D. primary calcium phosphate and gypsum

Answer: D

Watch Video Solution

44. The main constituent of egg-shells is:

A. $CaCO_3$

B. $CaSiO_3$

C. $CaSO_4\frac{.1}{2}H_2O$

D. $CaSO_4.2H_2O$

Answer: A

Watch Video Solution

45. Mixture of $MgCl_2$ and MgO is called:

A. Portland cement

B. Sorel's cement

C. double salt

D. none of these

Answer: B

Watch Video Solution

46. Solubility of alkaline earth metal hydroxides increases from $Be(OH)_2$ to $Ba(OH)_2$ because:

A. hydration energy $>$ lattice energy

B. lattice energy $>$ hydration energy

C. hydration energy is cqual to lattice energy

D. none of the above

Answer: A

Watch Video Solution

47. Celestine is an ore of:

A. Ba

B. Ca

C. Sr

D. Mg

Answer: C

Watch Video Solution

48. Bleaching powder loses its power on keeping for a long time because:

A. it changes into calcium hypochlorate

B. it changes into $CaCl_2$ and $Ca(OH)_2$

C. it absorbs moisture

D. it changes into calcium chloride and calcium chlorate

Answer: D

Watch Video Solution

49. Among LiCl, RbCl, $BeCl_2$ and $MgCl_2$ the compounds with greatest and least ionic character respectively are:

A. LiCI, RbCl

B. RbCl, $BeCl_2$

C. RbCl, $MgCl_2$

D. $MgCl_2$, $BeCl_2$

Answer: B

Watch Video Solution

50. A substance which gives a brick red flame and breaks down on heating giving oxygen anda brown gas is:

A. calcium carbonate

B. magnesium carbonate

C. magnesium nitrate

D. calcium nitrate

Answer: D

Watch Video Solution

51. Property of alkaline earth metals that increases with their atomic number is

A. Ionization energy

B. Solubility of their hydroxides

C. Solubility of their sulphates

D. Electronegativity

Answer: B

Watch Video Solution

52. The solubilities of carbonates decrease down the magnesium group due to a decrease in

A. Entropy of solution formation

B. Lattice energies of solids

C. Hydration energies of cations

D. Interionic attraction

Answer: C

Watch Video Solution

53. Which of the following is acidic in nature?

A. $Be(OH)_2$

B. $Mg(OH)_2$

C. $B(OH)_3$

D. $Al(OH)_3$

Answer: C

Watch Video Solution

54. The alkaline earth metal which does not directly combine with hydrogen is

A. Be

B. Ca

C. Sr

D. Ba

Answer: A

Watch Video Solution

55. 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: B

Watch Video Solution

56. A solid compound of group I element and it gives a bright red colour in the flame test. The solid is

A. LiBr

B. CsCl

C. KCl

D. NaCl

Answer: A

Watch Video Solution

57. Prepartion of which of the following substance does not involve NaCl as its one step?

A. Na metal

B. NaOH

C. Na_2O_2

D. Na_2CO_2

Answer: D

Watch Video Solution

58. Alkali metals can be extracted from their salts by

A. Reduction with carbon

B. Electrolysis of aqueous solution of their halides

C. Electrolysis of fused halides

D. Reduction with aluminium

Answer: C

Watch Video Solution

59. In Down's process, for manufacture of sodium metal, $CaCl_2$ is added to NaCl in order to

A. Increase ionisation of NaCl

B. Increase the melting point of NaCl

C. Decrease the melting point of NaCl

D. Increase conductance of electrolyte

Answer: C

Watch Video Solution

60. Microcosmic salt is

A. $Na(NH_4)HPO_{4.4}H_2O$

B. $Na(NH_4).\ H_2O$

C. $Na(NH_3)HPO_{4.4}H_2O$

D. $K(NH_4)HPO_{4.2}H_2O$

Answer: A

Watch Video Solution

61. The similarity in the properties of alkali metals is due to

A. Their same atomicity

B. Similar outer shell configuration

C. Same energy of outer shell

D. Same principal quantum number of outer shell

Answer: B

Watch Video Solution

62. Which of the following decomposes on heating?

A. LiOH

B. NaOH

C. KOH

D. CsOH

Answer: A

Watch Video Solution

63. Among the alkali metals, the most abundant metal is

A. Na

B. K

C. Li

D. Cs

Answer: A

Watch Video Solution

64. Sodium thiosulphate, $Na_2S_2O_{3.5}H_2O$ is used in photography to

A. Reduce the AgBr grains to metallic Ag

B. Convert metallic Ag to Ag salt

C. Remove undecomposed AgBras soluble silver thiosulphate complex

D. Removed reduced silver

Answer: D

Watch Video Solution

65. Saltpetre is

A. KNO_3

B. $NaNO_3$

C. $NaCl$

D. Na_2CO_3

Answer: A

Watch Video Solution

66. A pair of substances which cannot exist together in solution is

A. $NaHCO_3 + NaOH$

B. $NaHCO_3 + Na_2CO_3$

C. $Na_2CO_3 + NaOH$

D. $NaOH + NaCl$

Answer: A

Watch Video Solution

67. Magnesium uranyl test is used for

A. Sodium

B. Potassium

C. Rubidium

D. Caesium

Answer: A

Watch Video Solution

68. Lithia water used for the treatment of gout is

A. $LiHCO_3$

B. Li_2CO_3

C. Li_2SO_4

D. $LiOH$

Answer: A

Watch Video Solution

69. The stability of the following alkali metal chlorides follows the order:

A. $KCl > CsCl > NaCl > LiCl$

B. $LiCl > KCl > NaCl > CsCl$

C. $CsCl > KCl > NaCl > LiCl$

D. $NaCl > KCl > LiCl > CsCl$

Answer: A

Watch Video Solution

70. When a standard solution of NaOH is left in air for a few hours:

A. A precipitate will form

B. Strength will decrease

C. Strength will increase

D. The concentration of $Na^{\oplus}$ ions will remain constant

Answer: B

Watch Video Solution

71. Sodium hydride (NaH) when dissolved in water, produces

A. Acidic solution

B. Basic solution

C. Neutral solution

D. Cannot be predicted

Answer: B

Watch Video Solution

72. When sodium is added in scanty water, it catches fire. In this process which one of the following burns?

A. Na

B. H_2O

C. CO

D. H_2

Answer: D

Watch Video Solution

73. One of the natural minerals of sodium is tincal. Its formula is

A. $Na_2CO_3.\ 10H_2O$

B. $NaNO_3$

C. $Na_2B_4O_7.\ 10H_2O$

D. NaCl

Answer: C

Watch Video Solution

74. The alkalimetals are low melting. Which of the following alkali metal is expected to melt if the room temperature rises to $30^{\circ} C$?

A. Na

B. K

C. Rb

D. Cs

Answer: D

Watch Video Solution

75. Dead burnt plaster is

A. $CaSO_4$

B. $CaSO_4.\frac{1}{2}H_2O$

C. $CaSO_4.H_2O$

D. $CaSO_4.2H_2O$

Answer: A

Watch Video Solution

76. The salt of an alkali metal gives yellow colour in the flame test. Also its aqueous solution gives an insoluble white precipitate with barium chloride in acid medium. The salt is

A. NaCl

B. K_2SO_4

C. Na_2O and O_3

D. Li_2SO_4

Answer: C

Watch Video Solution

77. Sodium peroxide which is a yellow solid , when exposed to air becomes white due to the formation of

A. H_2O_2

B. Na_2O

C. Na_2O and O_3

D. $NaOH$ and Na_2CO_3

Answer: D

Watch Video Solution

78. Which of the following statements is false regarding alkali metals? : Alkali metals are soft and can be cut with the help of knife., Alkali metals

do not occur in free state in nature, Alkali metals are highly electropositive, Alkali metal hydrides are covalent in character

A. Alkali metals are soft and can be cut with the help of knife

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

C. Alkali metals are highly electropositive

D. Alkali metal hydrides are covalent in character

Answer: D

Watch Video Solution

79. The alkali halide which is soluble in pyridine is

A. NaCl

B. LiCl

C. KCl

D. CsI

Answer: B

Watch Video Solution

80. The second ionisation enthalpy of which of the following alkaline earth metals is the highest ?

A. Ba

B. Mg

C. Ca

D. Be

Answer: D

Watch Video Solution

81. Which pair of the following chlorides do not impart colour to the flame ?

A. $BeCl_2$ and $SrCl_2$

B. $BeCl_2$ and $MgCl_2$

C. $CaCl_2$ and $BaCl_2$

D. $BaCl_2$ and $SrCl_2$

Answer: B

Watch Video Solution

82. Which 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

Watch Video Solution

83. Which of the following on thermal decomposition yields a basic as well as an acidic oxide?

A. $KClO_3$

B. $CaCO_3$

C. NH_4NO_3

D. Li_2CO_3

Answer: B

Watch Video Solution

84. Which one of the following represents the composition of camallite mineral?

A. $K_2O.\ Al_2O_{3.6}SiO_2$

B. KNO_3

C. $K_2SO_4.MgSO_4.MgCl_{2.6}H_2O$

D. $KCl.MgCl_{2.6}H_2O$

Answer: D

Watch Video Solution

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

A. $CaOCl_2$

B. $Ca(OCl)_2$

C. CaO_2Cl

D. $CaCl_2$

Answer: B

Watch Video Solution

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

A. converting interlocking needle like crystals of hydrated silicates

B. keeping it cool

C. developing interlocking needle like crystals of hydrated silicates

D. hydrating sand and gravel mixed with cement

Answer: C

Watch Video Solution

87. The alkali metal which acts as a nutrient for plants is:

A. Na

B. K

C. Li

D. Rb

Answer: B

Watch Video Solution

88. The raw materials in Solvay process are:

A. NaOH, CaO and NH_3

B. Na_2CO_3, $CaCO_3$ and NH_3

C. Na_2SO_4, $CaCO_3$ and NH_3

D. $NaCl$, NH_3, $CaCO_3$

Answer: D

Watch Video Solution

89. Sodium thiosulphate is formed when:

A. NaOH is neutralised by H_2SO_4

B. Na_2S is boiled with S

C. Na_2SO_3 is boiled with Na_2S and I_2

D. Na_2SO_4 is boiled with Na_2S

Answer: C

Watch Video Solution

90. Magnesium metal is prepared by: reduction of MgO by coke, electrolysis of aqueous solution of $Mg(NO_3)_2$, displacement of Mg by iron from magnesium sulphate solution, electrolysis of molten magnesium chloride

A. reduction of MgO by coke

B. electrolysis of aqueous solution of $Mg(NO_3)_2$

C. displacement of Mg by iron from magnesium sulphate solution

D. electrolysis of molten magnesium chloride

Answer: D

Watch Video Solution

91. Portland cement does not contain

A. $CaSiO_4$

B. Ca_2SiO_5

C. $Ca_2Al_2O_6$

D. $Ca_3(PO_4)_2$

Answer: D

Watch Video Solution

92. Salt used as a purgative is:

A. NaCl

B. $MgSO_4.7H_2O$

C. $Ca_3Al_2O_6$

D. $MgCl_{2.6}H_2O$

Answer: B

Watch Video Solution

93. Superphosphate of lime is a mixture of: primary calcium phosphate and epsom, primary magnesium phosphate and epsom, primary magnesium phosphate and gypsum, primary calcium phosphate and gypsum

A. primary calcium phosphate and epsom

B. primary magnesium phosphate and epsom

C. primary magnesium phosphate and gypsum

D. primary calcium phosphate and gypsum

Answer: D

Watch Video Solution

94. The main constituent of egg-shells is:

A. $CaCO_3$

B. $CaSiO_3$

C. $CaSO_4.\frac{1}{2}H_2O$

D. $CaSO_4.2H_2O$

Answer: A

Watch Video Solution

95. Mixture of $MgCl_2$ and MgO is called:

A. Portland cement

B. Sorel's cement

C. double salt

D. none of these

Answer: B

Watch Video Solution

96. Solubility of alkaline earth metal hydroxides increases from $Be(OH)_2$ to $Ba(OH)_2$ because:

A. hydration energy $>$ lattice energy

B. lattice energy $>$ hydration energy

C. hydration energy is equal to lattice energy

D. none of the above

Answer: A

Watch Video Solution

97. Celestine is an ore of:

A. Ba

B. Ca

C. Sr

D. Mg

Answer: C

Watch Video Solution

98. Bleaching powder loses its power on keeping for a long time because:

A. it changes into calcium hypochlorate

B. it changes into $CaCl_2 \text{and} Ca(OH)_2$

C. it absorbs moisture

D. it changes into calcium chloride and calcium chlorate

Answer: D

Watch Video Solution

99. Among $LICI$, $RbCI$, $BeCl_2$ and $MgCl_2$ the compounds with greatest and least ionic character respectively are: $LiCl$, $RbCl$; $RbCl$, $BeCl_2$; $RbCl$, $MgCl_2$; $MgCl_2$, $BeCl_2$

A. LiCl, RbCl

B. $RbCl$, $BeCl_2$

C. $RbCl$, $MgCl_2$

D. $MgCl_2$, $BeCl_2$

Answer: B

Watch Video Solution

100. A substance which gives a brick red flame and breaks down on heating giving oxygen anda brown gas is:

A. calcium carbonate

B. magnesium carbonate

C. magnesium nitrate.

D. calcium nitrate

Answer: D

Watch Video Solution

Level Ii

1. Sodium metal reacts with Al_2O_3 at high temperature to give a sodium compound X. X reacts with carbon dioxide in water to form Y. Y is.....

A. Na_2O_2

B. Na_2O

C. Na_2CO_3

D. $NaAlO_2$

Answer: C

Watch Video Solution

2. The ease of adsorption of the hydrated alkali metal ions on an ion-exchange resins follows the order (1) L i + < K + < N a + < R b + (2) R b + < K + N a + < L I + (3) K + < N a + < R b + < L i + (4) N a + < L i + < K + < R b +

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

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

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

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

Answer: B

Watch Video Solution

3. Which of the following does not illustrate the anomalous properties of lithium?

A. Li is much softer than the other group first metals

B. The melting point and boiling point of Li are comparatively high

C. Li forms a nitride Li_3N unlike group first metals

D. The ion of Li and its compounds are more heavily hydrated than those of the rest of the group elements

Answer: A

Watch Video Solution

4. The solubility of metal halides depends on their nature, lattice enthalpy and hydration enthalpy of the individual ions. Amongst fluorides of alkali metals, the lowest solubility of LiF in water is due to

A. Ionic nature of lithium fluoride

B. High lattice enthalpy

C. High hydration enthalpy for lithium ion

D. Low ionisation enthalpy of lithium atom

Answer: B

Watch Video Solution

5. Which one of the following statement is true for all the alkali metals?

A. Their nitrates decompose on heating to give NO_2 and O_2

B. Their carbonates decompose on heating to give CO_2 and the metal oxide

C. They react with oxygen to give mainly the oxide M_2O

D. They react with halogens to give the halides MX

Answer: D

Watch Video Solution

6. Beryllium and aluminium exhibit many properties which are similar. But the two elements differ in:

A. exhibiting maximum covalency in compounds

B. forming polymeric hydrides

C. forming covalent halides

D. exhibiting amphoteric nature in their oxides

Answer: A

Watch Video Solution

7. The mobility of metal ions in aqueous medium ($Li^{\oplus}$, $Na^{\oplus}$, $K^{\oplus}$, $Rb^{\oplus}$) in the electric field, follows the order.

A. $Li^{\oplus} > Na^{\oplus} > K^{\oplus} > Rb^{\oplus}$

B. $Rb^{\oplus} > Na^{\oplus} \equiv K^{\oplus} > Li^{\oplus}$

C. $Li^{\oplus} < Na^{\oplus} < K^{\oplus} < Rb^{\oplus}$

D. $Na^{\oplus} \equiv K^{\oplus} > Rb^{\oplus} > Li^{\oplus}$

Answer: C

Watch Video Solution

8. The product of electrolysis of an aqueous solution of K_2SO_4 using inert electrodes, at anode and cathode respectively : O_2 and H_2 , O_2 and K , O_2 and SO_2, O_2 and SO_3

A. O_2 and H_2

B. O_2 and K

C. O_2 and SO_2

D. O_2 and SO_3

Answer: A

Watch Video Solution

9. Which of the following compound is used in gun powder? : $LiNO_3$, $NaNO_3$, $Pb(NO_3)_2$, KNO_3

A. $LiNO_3$

B. $NaNO_3$

C. $Pb(NO_3)_2$

D. KNO_3

Answer: D

Watch Video Solution

10. For which one of the following minerals, the composition given is incorrect?

A. Soda ash - (Na_2CO_3)

B. Carnallite- $(KCl.\ MgCl_2.6H_2O)$

C. Borax- $(Na_2B_4O_7.7H_2O)$

D. Glauber's salt - $(Na_2SO_4.10H_2O)$

Answer: C

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11. In the case of alkali metals, the covalent character decreases in the order: : $MF > MCl > MBr > MI$, $MF > MCl > MI > MBr$, $MI > MBr > MCl > MF, MCl > MI > MBr > MF$

A. $MF > MCl > MBr > MI$

B. $MF > MCl > MI > MBr$

C. $MI > MBr > MCl > MF$

D. $MCl > MI > MBr > MF$

Answer: C

Watch Video Solution

12. For the preparation of sodium thiosulphate by 'Spring's reaction', the reactants used are : $Na_2S + Na_2SO_3 + Cl_2$, $Na_2S + SO_2$, $Na_2S + Na_2SO_3 + I_2, Na_2SO_3 + S$

A. $Na_2S + Na_2SO_3 + Cl_2$

B. $Na_2S + SO_2$

C. $Na_2S + Na_2SO_3 + I_2$

D. $Na_2SO_3 + S$

Answer: C

Watch Video Solution

13. The metal X is prepared by the electrolysis of fused chloride. It reacts with hydrogen to form a colourless solid from which hydrogen is released on treatment with water. The metal is

A. Al

B. Ca

C. Cu

D. Zn

Answer: B

Watch Video Solution

14. Metal carbonates decompose on heating to give metal oxide and carbon dioxide. Which of the metal carbonates is most stable thermally?

A. $MgCO_3$

B. $CaCO_3$

C. $SrCO_3$

D. $BaCO_3$

Answer: D

Watch Video Solution

15. Amphoteric hydroxides react with both alkalies and acids. Which of the following Group 2 metal hydroxides is soluble in sodium hydroxide?

A. $Be(OH)_2$

B. $Mg(OH)_2$

C. $Ca(OH)_2$

D. $Ba(OH)_2$

Answer: A

Watch Video Solution

16. A chemical A is used for the preparation of washing soda to recover ammonia. When CO_2 is bubbled through an aqueous solution of A, the solution turns milky. It is used in white washing due to its disinfectant nature. What is the chemical formula of A?

A. $Ca(HCO_3)_2$

B. CaO

C. $Ca(OH)_2$

D. $CaCO_3$

Answer: C

Watch Video Solution

17. For two ionic solids CaO and KI, identify the wrong statement among the following?

A. Lattice energy of CaO is much higher than that of KI

B. KI is soluble in benzene

C. CaO has high melting point

D. KI has low melting point

Answer: D

Watch Video Solution

18. Which one of the following order represents the correct sequence of the increasing basic nature of the given oxides?

A. $MgO < K_2O < Al_2O_3 < Na_2O$

B. $Na_2O < K_2O < MgO < Al_2O_3$

C. $K_2O < Na_2O < Al_2O_3 < MgO$

D. $Al_2O_3 < MgO < Na_2O < K_2O$

Answer: D

Watch Video Solution

19. Choose the incorrect statement in the following:

A. BeO is almost insoluble but $BeSO_4$ is soluble in water

B. BaO is soluble but $BaSO_4$ is insoluble in water

C. LiI is more soluble than KI in ethanol

D. Both Li and Mg form solid hydrogen carbonates

Answer: D

Watch Video Solution

20. Which of the following statements is false?

A. Ca^{2+} ions are not important in maintaining the regular beating of the heart

B. Mg^{2+} ions are important in the green parts of the plants

C. Mg^{2+} ions forma complex with ATP

D. Ca^{2+} ions are important in blood cloating.

Answer: A

Watch Video Solution

21. A colourless salt gives violet colour to Bunsen flame and also turns moistured litmus paper blue. It is:

A. Na_2CO_3

B. KNO_3

C. K_2CO_3

D. $Cu(OH)_2$

Answer: C

Watch Video Solution

22. Pearl ash and caustic potash are chemically:

A. K_2CO_3 and KOH

B. KOH and K_2CO_3

C. Na_2CO_3 and KOH

D. Na_2CO_3 and NaOH

Answer: A

Watch Video Solution

23. Sodium sulphate is soluble in water whereas barium sulphate is sparingly soluble because:

A. the hydration energy of sodium sulphate is more than its lattice energy

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

C. the hydration energy of sodium sulphate is less than its lattice energy

D. None of the above

Answer: A

Watch Video Solution

24. Sodium chloride imparts a golden yellow colour to the Bunsen flame. This can be interpreted due to:

A. low ionization potential of sodium

B. photosensitivity of sodium

C. sublimation of metallic sodium to give yellow vapour

D. emission of excess of energy absorbed as a radiation in the visible region.

Answer: D

Watch Video Solution

25. Some large white transparent crystals are left out in a bowl for several days. They are then observed to have changed their form into white powder. The crystals may have been of:

A. ammonium chloride

B. sodium chloride

C. sodium carbonate

D. calcium oxide

Answer: C

Watch Video Solution

26. A and B are two salts. A with dilute HCl and B with conc. H_2SO_4 react to give reddish brown vapours, hence A and B respectively are:

A. NaBr, $NaNO_3$

B. $NaNO_3$, NaBr

C. NaBr, $NaNO_2$

D. $NaNO_2$, NaBr

Answer: D

Watch Video Solution

27. Na_2CO_3 can be manufactured by Solvay process but K_2CO_3 cannot be prepared because:

A. K_2CO_3 is more soluble

B. K_2CO_3 is less soluble

C. $K2CO_3$ is more soluble than $Na2CO_3$

D. $K2CO_3$ is less soluble than $Na2CO_3$

Answer: C

Watch Video Solution

28. Soda lime is

A. $Na_2CO_3 + CaO$

B. $NaOH + NaHCO_3$

C. $NaOH + CaO$

D. $NaH + Na_2CO_3$

Answer: C

Watch Video Solution

29. Sodium peroxide which is a yellow solid , when exposed to air becomes white due to the formation of

A. Na_2O

B. Na_2CO_3

C. $NaHCO_3$

D. NaOH

Answer: D

Watch Video Solution

30. A piece of magnesium ribbon was heated to redness in an atmosphere of N_2 and then treated with H_2O, the gas evolved is:

A. ammonia

B. hydrogen

C. nitrogen

D. oxygen

Answer: A

Watch Video Solution

31. Gypsum is added to clinker during cement manufacture to:

A. decrease the rate of setting of cement

B. make the cement impervious

C. bind the particles of calcium silicate

D. to facilitate the formation of colloidal gel

Answer: A

Watch Video Solution

32. Magnesium forms Mg^{2+} and not Mg^{+} because:

A. magnesium (II) carbonate is insoluble in water

B. generally higher oxidation states are preferred by metals

C. ionic radius of Mg(II) is smaller than of Mg(I)

D. hydration energy of divalent magnesium ion is higher

Answer: D

Watch Video Solution

33. A chloride dissolves appreciably in cold water. When placed on a platinum wire in Bunsen flame, no distinctive colour is noticed. Which one is cation?

A. Mg^{2+}

B. Ba^{2+}

C. Pb^{2+}

D. Ca^{2+}

Answer: C

Watch Video Solution

34. Limestone is not used in which of the following manufacturing processes?

A. Phosphorus from phosphorite

B. Ordinary (soda lime) glass

C. Iron from haematite

D. Solvay process of sodium carbonate

Answer: C

Watch Video Solution

35. Which category of salts of alkaline earth metals is not found in solid state, but found in solution state?

A. Carbonates

B. Bicarbonates

C. Hydroxides

D. Sulphates

Answer: B

Watch Video Solution

36. A metal M readily forms sulphate MSO_4 which is water soluble. It forms oxide MO which becomes inert on heating. It forms insoluble hydroxide which is soluble in NaOH. The metal M is

A. Mg

B. Ba

C. Ca

D. Be

Answer: D

Watch Video Solution

37. Sodium is heated in air at $350^\circ C$ to form X. X absorbs CO_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: B

Watch Video Solution

38. On heating a mixture containing 1 mole each of Li_2CO_3 and K_2CO_3 .... is/are formed:

A. 2 moles of CO_2

B. 1 mole of CO_2

C. 1.5 moles of CO_2

D. no carbon dioxide

Answer: B

Watch Video Solution

39. There is loss in mass when mixture of Li_2CO_3 and $Na_2CO_3.10H_2O$ is heated strongly. The loss is due to:

A. Li_2CO_3 only

B. $Na_2CO_3.10H_2O$ only

C. both Li_2CO_3 and $Na_2CO_3.10H_2O$

D. none of these

Answer: C

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40. Identify the correct statement:

A. The percentage of calcium is lower in gypsum in comparison to plaster of Paris.

B. Gypsum is not a natural product. It is obtained by heating of plaster of Paris.

C. Plaster of Paris is obtained by hydration of gypsum.

D. Plaster of Paris is formed by oxidation of gypsum.

Answer: A

Watch Video Solution

41. Which of the following pairs of substances would give same gaseous product on reaction with water

A. Na and Na_2O_2

B. Ca and CaH_2

C. Ca and CaO

D. Ba and BaO_2

Answer: B

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42. The hydration energy of Mg^{2+} ion is

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

B. more than that of Na^{+} ion

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

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

Answer: B

Watch Video Solution

43. The name and formula of the compound of magnesium chlorine and oxygen used as a drying agent is:

A. magnesium oxychlorite, $Mg(OCl)_2$

B. magnesium chlorate, $Mg(ClO_3)_2$

C. magnesium perchlorate, $Mg(ClO_4)_2$

D. none of the above

Answer: C

Watch Video Solution

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

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

$Mg_2C_3 + H_2O \rightarrow Mg(OH)_2 + Z$. X, Y and Z are respectively:

A. CH_4, C_2H_2, C_3H_8

B. CH_4, C_2H_6, C_3H_8

C. CH_4, C_2H_2, C_3H_4

D. C_2H_2, C_2H_6, C_3H_4

Answer: C

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45. $X + C + Cl_2 \xrightarrow{\text{High temp.}} Y + CO \quad , \quad Y + 2H_2O \rightarrow Z + 2HCl$

Compound Y is found in polymeric chain structure and is an electron deficient molecule. The compound Y is:

A. BeO

B. $BeCl_2$

C. $Be(OH)_2$

D. $BeO.\ Be(OH)_2$

Answer: B

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46. Which metal bicarbonates does not exist in solid state?

$i)LiHCO_3\ ii)Ca(HCO_3)_2\ iii)Zn(HCO_3)_2\ iv)NaHCO_3\ v)AgHCO_3$:

(i), (ii), (iii), (v); (i), (ii), (iii); (i), (ii), (v); (ii), (iii), (iv)

A. (i), (ii), (v)

B. (i), (ii), (iii)

C. (i), (ii), (v)

D. (ii), (iii), (iv)

Answer: A

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47. The correct sequence of increasing covalent character is

A. $BeCl_2 < NaCl < LiCl$

B. $NaCl < LiCl < BeCl_2$

C. $BeCl_2 < LiCl < NaCl$

D. $LiCI < NaCl < BeCl_2$

Answer: B

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48. Correct order of increasing thermal stabilities of alkaline earth metal sulphates is:

A. $SrSO_4 < CaSO_4 < MgSO_4 < BeSO_4$

B. $BeSO_4 < MgSO_4 < CaSO_4 < SrSO_4$

C. $CaSO_4 < BeSO_4 < MgSO_4 < SrSO_4$

D. $MgSO_4 < BeSO_4 < CaSO_4 < SrSO_4$

Answer: B

Watch Video Solution

49. Which salt does not show hydrolysis at all?

A. $Mg(NO_3)_2$

B. $Be(NO_3)_2$

C. $Ca(NO_3)_2$

D. $Ba(NO_3)_2$

Answer: B

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50. The correct order of ability to form complexes is:

A. $Be^{2+} < Mg^{2+} < Ca^{2+} < Ba^{2+}$

B. $Be^{2+} < Mg^{2+} < Ca^{2+} < Ba^{2+}$

C. $Be^{2+} < Mg^{2+} < Ca^{2+} < Ba^{2+}$

D. $Ba^{2+} < Mg^{2+} < Ca^{2+} < Be^{2+}$

Answer: C

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51. Sodium metal reacts with Al_2O_3 at high temperature to give a sodium compound X. X reacts with carbon dioxide in water to form Y. Y is.....

A. Na_2O_2

B. Na_2O

C. Na_2CO_3

D. $NaAlO_2$

Answer: C

Watch Video Solution

52. The ease of adsorption of the hydrated alkali metal ions on an ion-exchange resins follows the order (1) L i + < K + < N a + < R b + (2) R b + < K + N a + < L I + (3) K + < N a + < R b + < L i + (4) N a + < L i + < K + < R b +

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

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

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

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

Answer: B

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53. Which of the following does not illustrate the anomalous properties of lithium?

A. Li is much softer than the other group first metals

B. The melting point and boiling point of Li are comparatively high

C. Li forms a nitride Li_3 N unlike group first metals

D. The ion of Li and its compounds are more heavily hydrated than those of the rest of the group elements

Answer: A

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54. The solubility of metal halides depends on their nature, lattice enthalpy and hydration enthalpy of the individual ions. Amongst fluorides of alkali metals, the lowest solubility of LiF in water is due to

A. Ionic nature of lithium fluoride

B. High lattice enthalpy

C. High hydration enthalpy for lithium ion

D. Low ionisation enthalpy of lithium atom

Answer: B

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55. Which one of the following statement is true for all the alkali metals?

A. Their nitrates decompose on heating to give NO_2 and O_2

B. Their carbonates decompose on heating to give CO_2 and the metal oxide

C. They react with oxygen to give mainly the oxide M_2O

D. They react with halogens to give the halides MX

Answer: D

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56. Beryllium and aluminium exhibit many properties which are similar. But the two elements differ in:

A. exhibiting maximum covalency in compounds

B. forming polymeric hydrides

C. forming covalent halides

D. exhibiting amphoteric nature in their oxides

Answer: A

Watch Video Solution

57. The mobility of metal ions in aqueous medium ($Li^{\oplus}$, $Na^{\oplus}$, $K^{\oplus}$, $Rb^{\oplus}$) in the electric field, follows the order.

A. $Li^{\oplus} > Na^{\oplus} > K^{\oplus} > Rb^{\oplus}$

B. $Rb^{\oplus} > Na^{\oplus} \equiv K^{\oplus} > Li^{\oplus}$

C. $Li^{\oplus} < Na^{\oplus} < K^{\oplus} < Rb^{\oplus}$

D. $Na^{\oplus} \equiv K^{\oplus} > Rb^{\oplus} > Li^{\oplus}$

Answer: C

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58. The product of electrolysis of an aqueous solution of K_2SO_4 using inert electrodes, at anode and cathode respectively : O_2 and H_2 , O_2 and K , O_2 and SO_2, O_2 and SO_3

A. O_2 and H_2

B. O_2 and K

C. O_2 and K

D. O_2 and SO_2

Answer: A

Watch Video Solution

59. Which of the following compound is used in gun powder? : $LiNO_3$, $NaNO_3$, $Pb(NO_3)_2$, KNO_3

A. $LiNO_3$

B. $NaNO_3$

C. $Pb(NO_3)_2$

D. KNO_3

Answer: D

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60. For which one of the following minerals, the composition given is incorrect?

A. Soda ash $-(Na_2CO_3)$

B. Carnallite $(KCl.\ MgCl_{2.6}H_2O)$

C. Borax $(Na_2B_4O_{7.7}H_2O)$

D. Glauber's salt - $(Na_2SO_{4.10}H_2O)$

Answer: C

Watch Video Solution

61. In the case of alkali metals, the covalent character decreases in the order: : $MF > MCl > MBr > MI$, $MF > MCl > MI > MBr$, $MI > MBr > MCl > MF, MCl > MI > MBr > MF$

A. $MF > MCl > MBr > MI$

B. $MF > MCl > MI > MBr$

C. $MI > MBr > MCl > MF$

D. $MCl > MI > MBr > MF$

Answer: C

Watch Video Solution

62. For the preparation of sodium thiosulphate by 'Spring's reaction', the reactants used are : $Na_2S + Na_2SO_3 + Cl_2$, $Na_2S + SO_2$, $Na_2S + Na_2SO_3 + I_2, Na_2SO_3 + S$

A. $Na_2S + Na_2SO_3 + Cl_2$

B. $Na_2S + SO_2$

C. $Na_2S + Na_2SO_3 + I_2$

D. $Na_2SO_3 + S$

Answer: C

Watch Video Solution

63. The metal X is prepared by the electrolysis of fused chloride. It reacts with hydrogen to form a colourless solid from which hydrogen is released on treatment with water. The metal is

A. Al

B. Ca

C. Cu

D. Zn

Answer: B

Watch Video Solution

64. Metal carbonates decompose on heating to give metal oxide and carbon dioxide. Which of the metal carbonates is most stable thermally?

A. $MgCO_3$

B. $CaCO_3$

C. $SrCO_3$

D. $BaCO_3$

Answer: D

Watch Video Solution

65. Amphoteric hydroxides react with both alkalies and acids. Which of the following Group 2 metal hydroxides is soluble in sodium hydroxide?

A. $Be(OH)_2$

B. $Mg(OH)_2$

C. $Ca(OH)_2$

D. $Ba(OH)_2$

Answer: A

Watch Video Solution

66. A chemical A is used for the preparation of washing soda to recover ammonia. When CO_2 is bubbled through an aqueous solution of A, the solution turns milky. It is used in white washing due to its disinfectant nature. What is the chemical formula of A?

A. $Ca(HCO_3)_2$

B. CaO

C. $Ca(OH)_2$

D. $CaCO_3$

Answer: C

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67. For two ionic solids CaO and KI, identify the wrong statement among the following?

A. Lattice energy of CaO is much higher than that of KI

B. Kl is soluble in benzene

C. CaO has high melting point

D. KI has high melting point

Answer: D

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68. Which one of the following order represents the correct sequence of the increasing basic nature of the given oxides?

A. $MgO < K_2O < Al_2O_3 < Na_2O$

B. $Na_2O < K_2O < MgO < Al_2O_3$

C. $K_2O < Na_2O < Al_2O_3 < MgO$

D. $Al_2O_3 < MgO < Al_2O_3$

Answer: D

Watch Video Solution

69. Choose the incorrect statement in the following:

A. BeO is almost insoluble but $BeSO_4$ is soluble in water

B. BaO is soluble but $BaSO_4$ is insoluble in water

C. LiI more soluble than KI in ethanol

D. Both Li and Mg form solid hydrogen carbonates

Answer: D

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70. Which of the following statements is false?

A. Ca^2 ions are not important in maintaining the regular beating of the heart

B. Mg^{2+} ions are important in the green parts of the plants

C. Mg^{2+} ions form a complex with ATP

D. Ca^{2+} ions are important in blood cloating.

Answer: A

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71. A colourless salt gives violet colour to Bunsen flame and also turns moistured litmus paper blue. It is:

A. Na_2CO_3

B. KNO_3

C. K_2CO_3

D. $Cu(OH)_2$

Answer: C

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72. Pearl ash and caustic potash are chemically:

A. K_2CO_3 and KOH

B. KOH and K_2CO_3

C. Na_2CO_3 and KOH

D. Na_2CO_3 and $NaOH$

Answer: A

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73. Sodium sulphate is soluble in water whereas barium sulphate is sparingly soluble because:

A. the hydration energy of sodium sulphate is more than its lattice energy

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

C. the hydration energy of sodium sulphate is less than its lattice energy

D. None of the above

Answer: A

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74. Sodium chloride imparts a golden yellow colour to the Bunsen flame. This can be interpreted due to:

A. low ionization potential of sodium

B. photosensitivity of sodium

C. sublimation of metallic sodium to give yellow vapour

D. emission of excess of energy absorbed as a radiation in the visible region.

Answer: D

Watch Video Solution

75. Some large white transparent crystals are left out in a bowl for several days. They are then observed to have changed their form into white powder. The crystals may have been of:

A. ammonium chloride

B. sodium chloride

C. sodium carbonate

D. calcium oxide

Answer: C

Watch Video Solution

76. A and B are two salts. A with dilute HCl and B with conc. H_2SO_4 react to give reddish brown vapours, hence A and B respectively are:

A. NaBr, $NaNO_3$

B. $NaNO_3$, $NaBr$

C. $NaBr$, $NaNO_2$

D. $NaNO_2$, $NaBr$

Answer: D

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77. Na_2CO_3 can be manufactured by Solvay process but K_2CO_3 cannot be prepared because:

A. K_2CO_3 is more solulble

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

Watch Video Solution

78. Soda lime is

A. $Na_2CO_3 + CaO$

B. $NaOH + NaHCO_3$

C. $NaHCO_3$

D. $NaOH$

Answer: C

Watch Video Solution

79. Sodium peroxide which is a yellow solid , when exposed to air becomes white due to the formation of

A. Na_2O

B. Na_2CO_3

C. $NaHCO_3$

D. $NaOH$

Answer: D

Watch Video Solution

80. A piece of magnesium ribbon was heated to redness in an atmosphere of N_2 and then treated with H_2O, the gas evolved is:

A. ammonia

B. hydrogen

C. nitrogen

D. oxygen

Answer: A

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81. Gypsum is added to clinker during cement manufacture to:

A. decrease the rate of setting of cement

B. make the cement impervious

C. bind the particles of calcium silicate

D. to facilitate the formation of colloidal gel

Answer: A

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82. Magnesium forms Mg^{2+} and not Mg^{+} because:

A. magnesium (II) carbonate is insoluble in water

B. generally higher oxidation states are preferred by metals

C. ionic radius of Mg(II) is smaller than of Mg(I)

D. hydration energy of divalent magnesium ion is higher

Answer: D

Watch Video Solution

83. A chloride dissolves appreciably in cold water. When placed on a platinum wire in Bunsen flame, no distinctive colour is noticed. Which one is cation?

A. Mg^{2+}

B. Ba^{2+}

C. Pb^{2+}

D. Ca^{2+}

Answer: A

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84. Limestone is not used in which of the following manufacturing processes?

A. Phosphorus from phosphorite

B. Ordinary (soda lime) glass

C. Iron from haematite

D. Solvay process of sodium carbonate

Answer: A

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85. Which category of salts of alkaline earth metals is not found in solid state, but found in solution state?

A. Carbonates

B. Bicarbonates

C. Hydroxides

D. Sulphates

Answer: B

Watch Video Solution

86. A metal M readily forms sulphate MSO_4 which is water soluble. It forms oxide MO which becomes inert on heating. It forms insoluble hydroxide which is soluble in NaOH. The metal M is

A. Mg

B. Ba

C. Ca

D. Be

Answer: D

Watch Video Solution

87. Sodium is heated in air at $350^\circ C$ to form X. X absorbs CO_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: B

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88. On heating a mixture containing 1 mole each of Li_2CO_3 and K_2CO_3 .... is/are formed:

A. 2 moles of CO_2

B. 1 mole of CO_2

C. 1.5 moles of CO_2

D. no carbon dioxide

Answer: B

Watch Video Solution

89. There is loss in mass when mixture of Li_2CO_3 and $Na_2CO_3.10H_2O$ is heated strongly. The loss is due to:

A. Li_2CO_3 only

B. $Na_2CO_3.\ 10H_2O$ only

C. both Li_2CO_3 and $Na_2CO_{3.10}H_2O$

D. CO_2

Answer: C

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90. Identify the correct statement:

A. The percentage of calcium is lower in gypsum in comparison to plaster of Paris.

B. Gypsum is not a natural product. It is obtained by heating of plaster of Paris

C. Plaster of Paris is obtained by hydration of gypsum.

D. Plaster of Paris is formed by oxidation of gypsum.

Answer: A

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91. Which of the following pairs of substances would give same gaseous product on reaction with water

A. Na and Na_2O_2

B. Ca and CaH_2

C. Ca and CaO

D. Ba and BaO_2

Answer: B

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92. The hydration energy of Mg^{2+} ion is

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

B. more than that of Na^{+} ion

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

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

Answer: B

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93. The name and formula of the compound of magnesium chlorine and oxygen used as a drying agent is:

A. magnesium oxychlorite , $Mg(OCl_2)$

B. magnesium chalorate , $Mg(ClO_3)_2$

C. magnesium perchlorate $Mg(ClO_4)_2$

D. none of the above

Answer: C

Watch Video Solution

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

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

$Mg_2C_3 + H_2O \rightarrow Mg(OH)_2 + Z$, X, Y and Z are respectively.

A. CH_4, C_2H_2, C_3H_8

B. CH_4, C_2H_6, C_3H_8

C. CH_4, C_2H_2, C_3H_4

D. C_2H_2, C_2H_4, C_3H_4

Answer: C

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95. $X + C + Cl_2 \xrightarrow{\text{High temp.}} Y + CO \quad , \quad Y + 2H_2O \rightarrow Z + 2HCl$

Compound Y is found in polymeric chain structure and is an electron deficient molecule. The compound Y is:

A. BeO

B. $BeCl_2$

C. $B(OH)_2$

D. $BeO.\ Be(OH)_2$

Answer: B

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96. Which metal bicarbonates does not exist in solid state?

$i)LiHCO_3\ ii)Ca(HCO_3)_2\ iii)Zn(HCO_3)_2\ iv)NaHCO_3\ v)AgHCO_3$:

(i), (ii), (iii), (v); (i), (ii), (iii); (i), (ii), (v); (ii), (iii), (iv)

A. (ii),(iii),(v)

B. (i),(ii),(iii)

C. (i),(ii),(v)

D. (ii),(iii),(iv)

Answer: A

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97. The correct sequence of increasing covalent character is

A. $BeCl_2 < NaCl < LiCl$

B. $NaCl < LiCl < BeCl_2$

C. $BeCl_2 < LiCl < NaCl$

D. $LiCl < NaCl < BeCl_2$

Answer: B

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98. Correct order of increasing thermal stabilities of alkaline earth metal sulphates is:

A. $SrSO_4 < CaSO_4 < MgSO_4 < BeSO_4$

B. $BeSO_4 < MgSO_4 < CaSO_4 < SrSO_4$

C. $CaSO_4 < BeSO_4 < MgSO_4 < SrSO_4$

D. $MgSO_4 < BeSO_4 < CaSO_4 < SrSO_4$

Answer: B

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99. Which salt does not show hydrolysis at all?

A. $Mg(NO_3)_2$

B. $Be(NO_3)_2$

C. $Ca(NO_3)_2$

D. $Ba(NO_3)_2$

Answer: D

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100. The correct order of ability to form complexes is:

A. $Be^{2+} < Mg^{2+} < Ca^{2+} < Ba^{2+}$

B. $Be^{2+} > Mg^{2+} < Ca^{2+} < Ba^{2+}$

C. $Be^{2+} > Mg^{2+} < Ca^{2+} < Ba^{2+}$

D. $Ba^{2+} < Mg^{2+} < Ca^{2+} > Be^{2+}$

Answer: C

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Level Ii Assertion Reason Type

1. Assertion : Potassium and caesium are useful as electrodes in photoelectric cells.

Reason : Potassium and caesium, when irradiated with light, the light energy absorbed is sufficient to eject out the electron from a atom.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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2. Assertion : s-block elements do not occur in free state.

Reason : s-block elements are highly electropositive in nature.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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3. In the following question, an Assertion (A) is followed by a corresponding Reason (R). Use the following keys to choose the appropriate answer.

Assertion : LiCl is a typical ionic compound exhibiting covalent characters.

Reason : Electronegativity difference between Li and Cl is too small.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: C

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4. Assertion : SO_4^{2-} is estimated as $BaSO_4$, but not as $MgSO_4$

Reason : Ionic radius of Mg^{2+} is smaller than that of Ba^{2+}

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: B

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5. Assertion : Superoxides of alkali metals are paramagnetic.

Reason : Superoxides contain the ion O_2^- which has one unpaired electron.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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6. Assertion : Li^+ ion has the lowest mobility in aqueous solution.

Reason : Lithium has higher ionization energy.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: B

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7. Assertion : Lithium fluoride is most covalent in nature.

Reason : Small anion can be easily distorted.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: D

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8. Assertion : $BeSO_4$ and $MgSO_4$ are insoluble in water.

Reason : Be^{2+} and Mg^{2+} have low hydration enthalpies.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: D

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9. Assertion : Alkali metals are obtained by electrolysis of molten salt and not aqueous solution.

Reason : The discharge potential of H^+ ions is lower than alkali metal cation hence hydrogen is discharged at cathode instead of metal.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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10. Assertion : Alkaline earth metal oxides are quite stable to heat.

Reason : Enthalpies of formation of alkaline earth metal oxides are quite high.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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11. Assertion : Among the alkali metals, caesium salts exhibit the maximum electrical conductance in aqueous solutions.

Reason : The radius of hydrated caesium ion is the highest among alkali metals.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: C

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12. Assertion : Alkali metals impart colour to the flame.

Reason : Their ionization energies are low.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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13. Assertion : K, Rb and Cs form superoxides.

Reason : The stability of the superoxides increases from 'K' to 'Cs' due to decrease in lattice energy.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: C

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14. Assertion : The mobility of sodium ion is lower than that of potassium ion.

Reason : The ionie mobilities depend upon the effective radius of the ion.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: B

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15. Assertion : Calcium and magnesium oxides are not reduced by carbon.

Reason : Calcium and magnesium oxides react with carbon to form their respective carbides.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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16. Assertion : Na_2SO_4 is soluble in water while $BaSO_4$ is insoluble.

Reason : Lattice energy of barium sulphate exceeds its hydration energy.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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17. Assertion : Aqueous solution of Na_2CO_3 is alkaline in nature.

Reason : When dissolved in water, Na_2CO_3 undergo anion hydrolysis.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: A

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18. Assertion : Sodium reacts with oxygen to form Na_2O_2 but potassium reacts with oxygen to form KO_2.

Reason : Potassium is more reactive than sodium.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: B

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19. Assertion : Alkaline earth metals are harder than alkali metals.

Reason : Atomic radii of alkaline earth metals are smaller than the corresponding alkali metals in the same period.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: B

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20. Assertion : Alkali metals dissolve in liquid ammonia to give blue solutions.

Reason : Alkali metals in liquid ammonia give solvated species of the type $\left[M(NH_3)_n\right]^+$ (M=alkali metals)

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If both (A) and (R) are incorrect.

Answer: B

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Level Iii Single Correct Answer Type

1. Zinc on reaction with NaOH gives a salt (A) along with a gas (X) and (A) on reaction with a gas (Y) gives white precipitate (W). Which of the following is correct? $(A) is Na_4ZnO_3, (Y) is H_2S;$ $(X) is H_2, (W) is Zn(OH)_2;$ $(A) is Na_2ZnO_2, (X) is O_2;$ $(W) is ZnS, (X) is H_2$

A. $(A) is Na_4ZnO_3, (Y) is H_2S$

B. $(X) is H_2, (W) is Zn(OH)_2$

C. $(A) is Na_2ZnO_2, (X) is O_2$

D. $(W) is ZnS, (X) is H_2$

Answer: D

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2.

$$X + Na_2CO_3 \longrightarrow Y + Z$$

$$\xrightarrow{CO_2} \text{Milky cloud, Z}$$

The chemical formulae of X, Y and Z are:

	X	Y	Z
A)	$Ca(OH)_2$	NaOH	$CaCO_3$
B)	NaOH	$Ca(OH)_2$	$CaCO_3$
C)	NaOH	CaO	$CaCO_3$
D)	CaO	$Ca(OH)_2$	NaOH

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3. When a substance A reacts with water it produces a combustible gas B and a solution of a substance C in water. When another substance D reacts with this solution of C, it also produces the same gas Bon warming, but D can produce B on reaction with dilute sulphuric acid at room

temperature. A imparts a deep golden yellow colour to a smokeless flame of Bunsen burner. A, B, C and D respectively are:

A. $Na, H_2, NaOH$ and Zn

B. K, H_2, KOH and Al

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

D. $CaC_2, C_2H_2, Ca(OH)_2$ and Sn

Answer: A

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4. The aqueous solution of an unknown sodium salt gives the following reactions:

(I) It gives white turbidity with dilute HCI solution

(II) It decoloursise a solution of iodine in potassium iodide

(III) It gives a white precipitate with $AgNO_3$ solution which changes colours and finally becomes black on standing. The unknown sodium salt is:

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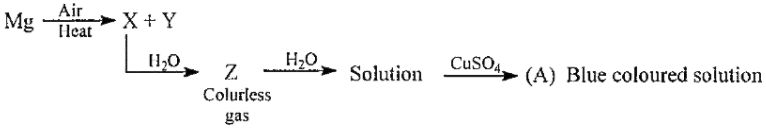

5.

Substances X,Y,Z and A are respectively

A. $Mg_3N_2, MgO, NH_3, CuSO_4, 5H_2O$

B. $Mg(NO_3)_2. MgO, H_2, CuSO_{4.5}H_2O$

C. $Mg_3N_2, MgO, NH_3, \left[Cu(NH_3)_4\right]SO_4$

D. $Mg(NO_3)_2, MgO_2, H_2O_2, CuSO_{4.5}H_2O$

Answer: C

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6. An alkaline earth metal gives a salt with chlorine which is sparingly soluble in water at room temperature but fairly soluble in boiling water. It

also forms a sulphate whose mixture with a sulphide of a transition metal is called “lithopone’ and is used as a white pigment. The alkaline earth metal is: Ca, Mg, Sr, Ba

A. Ca

B. Mg

C. Sr

D. Ba

Answer: D

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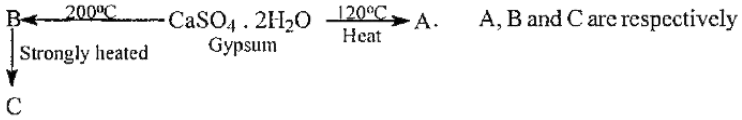
7. Find the final product of the reaction



A, B and C are respectively

A. Plaster of Paris, dead burnt plaster, calcium sulphide

B. Dead burnt plaster, plaster of Paris, lime

C. Plaster of Paris, dead burnt plaster, lime

D. Anhydrous calcium sulphate, plaster of Paris, calcium sulphit

Answer: C

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8. Which of the following statements is not correct? : Common salt absorbs water because it is hygroscopic, Common salt is used to clear snow on the road , Anhydrous $MgCl_2$ can be prepared by heating a double salt of it, ie $MgCl_2.NH_4Cl.6H_2O$, $CaSO_4$ and $BaSO_4$ are reacted with coke to produce CaS and BaS respectively.

A. Common salt absorbs water because it is hygroscopic

B. Common salt is used to clear snow on the road

C. Anhydrous $MgCl_2$ can be prepared by heating a double salt of it, ie

$MgCl_2.NH_4Cl.6H_2O$

D. $CaSO_4$ and $BaSO_4$ are reacted with coke to produce CaS and BaS respectively.

Answer: A

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Level Iii Multiple Choice Question

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

A. Be, Al, Ca

B. Mg, Ba, Sr

C. Be, Rb, Cs

D. Na, K, Ca

Answer: A::B

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2. Choose the correct statements from the following.

A. Beryllium exhibits coordination number more than four.

B. Beryllium sulphate is readily soluble in water as the greater hydration enthalpy of Be +2 overcomes the lattice enthalpy factor.

C. Beryllium is not readily attacked by acids because of the presence of an oxide film on the surface of the metal

D. Beryllium oxide is purely acidic in nature

Answer: B::C

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3. Which of the following are correct reasons for anomalous behaviour of lithium?

A. Exceptionally small size of its atom

B. Its high polarising power

C. It has high degree of hydration

D. Exceptionally low ionisation enthalpy

Answer: A::B

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4. The compounds formed upon combustion of sodium metal in excess air are

A. Na_2O_2

B. Na_2O

C. NaO_2

D. $NaOH$

Answer: A::B

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5. Which of the following are not the correct reasons for anomalous behaviour of lithium?

A. Exceptionally small size of its atom

B. Its low polarizing power

C. It has high degree of hydration

D. Exceptionally low ionization enthalpy

Answer: C::D

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6. Which of the following statements are not correct?

A. All alkali metals form oxides on burning in air.

B. The solubilities of chlorides and hydroxides of alkaline-earth metals in water increase on descending the group.

C. $Be(OH)_2$ is basic in nature

D. The tendency of complex formation of alkaline earth metals increases down the group.

Answer: C::D

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7. Which of the following statements are correct?

A. A. Potassium superoxide is diamagnetic in nature

B. B. The thermal stability of hydroxides of Group 1 decreases on moving down the group

C. C. Potassium carbonate cannot be prepared by Solvay process as potassium bicarbonate is highly soluble in water

D. D. The solubility of bicarbonates of Group 1 is less than the corresponding carbonates.

Answer: C::D

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8. Which of the following statements are correct?

A. A. Unlike magnesium chloride, calcium chloride can be obtained by heating $CaCl_{2.6}H_2O$

B. B. Halides of elements of Group 2 with the exception of $BeCl_2$ are ionic

C. C. The decrease in the solubility from $BeSO_4$ to $BaSO_4$ is primarily due to decrease in the hydration energy as one moves from Be^{2+} to Ba^{2+}.

D. D. The increase in the solubility of hydroxides of alkaline earth metals is primarily due to the decrease in lattice energy from Be to Ba salts.

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

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9. Which of the following statements are not correct?

A. A. Calcium peroxide is more stable than magnesium peroxide.

B. B. All elements except Be of Group 2 form monoxide and peroxides.

C. C. All oxides of elements of Group 2 are basic with the exception of BeO which is amphoteric.

D. D. The thermal stability of peroxides of elements of Group 2 decreases on descending the group.

Answer: A::D

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10. Which of the following statements are correct?

A. Calcium peroxide is crystallized with the molecular formula $CaO_3 x H_2O$

B. An aqueous suspension of $Mg(OH)_2$ is known as milk of magnesia

C. Magnesium chloride is crystallized with molecular formula $MgCl_{2.7}H_2O$

D. Calcium sulphate is crystallized with the molecular formula $CaSO_{4.2}H_2O$

Answer: A::B::D

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Level Iii Numerical Type

1. Out of Li, Na, K, Rb and Cs, how many of them directly form superoxides on heating with dioxygen?

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2. The sulphates of which of the following metals dissolve in water.

$SrSO_4$, K_2SO_4, $BeSO_4$, Li_2SO_4, $MgSO_4$, $BaSO_4$, $NaSO_4$, $CaSO_4$, Rb_2SO

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3. In the polymeric BeH_2 structure, each beryllium is bound to

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4. The number of elements among the following that do not give characteristic colour in flame test is ....

Ca, Li, Mg, Be, Ba, Sr, Na, K

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5. The number of elements among the following that will form nitrides when heated in an atmosphere of nitrogen is .....

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

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6. How many water molecules are associated with epsom salt?

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7. Washing soda on standing on air effloresces. How many water molecules are lost?

A. 8

B. 9

C. 10

D. 7

Answer: 9

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8. Calculate heat of solution of NaCl from the following data: Hydration energy of $Na^{\oplus} = -389 kJ mol^{-1}$

Hydration energy of $Cl^{\Theta} = -382 kJ mol^{-1}$, Lattice energy of NaCl = -776 kJ mol^{-1}

A. 1

B. 3

C. 4

D. 5

Answer: 5

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9. How many moles of ammonia are produced on hydrolysis of five moles of Li_3N ?

A. 1

B. 5

C. 6

D. 4

Answer: 5

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10. Calcium carbide reacts with nitrogen and forms an important fertilizer, calcium cyanamide. How much calcium cyanamide is formed when 6.4 gof calcium carbide is completely converted into cyanamide?

A. 7

B. 6

C. 8

D. 5

Answer: 8

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11. Magnesium oxide when mixed with a saturated solution of $MgCl_2$, sets to a hard mass known as 'Sorel cement. The composition of Sorel cement is $MgCl_2, nMgO. xH_2O$ What is the value of n ?

A. 8

B. 6

C. 5

D. 4

Answer: 5

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Level Iii Matching Column Type

1. Matching Column Type

	Column I	Column II
A)	$M^{2+} + K_2CrO_4 \longrightarrow$ Yellow ppt.	p) Li
B)	Metal + $NH_3 \longrightarrow$ Bronze solution	q) Mg
C)	MCl_2 + conc. $H_2SO_4 \longrightarrow$ White ppt.	r) Ba
D)	$M(SO_4)_x \xrightarrow{\Delta} SO_3 + M_2O_x$	s) Na

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2. Matching Column Type

	Column I		Column II
A)	Crystal carbonate	p)	KNO_3 + Charcoal + S
B)	Black ash	q)	$NaNH_4HPO_4$
C)	Gun powder	r)	$Na_2CO_3.H_2O$
D)	Microcosmic salt	s)	$Na_2CO_3 + CaS$

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3. Match the compounds with their properties

Column I		Column II	
A)	$CaCO_3$	p)	Insoluble in water
B)	$CaSO_4.2H_2O$	q)	Amphoteric nature
C)	$BaCO_3$	r)	Insoluble in water but dissolves in the presence of CO_2
D)	$Be(OH)_2$	s)	Gives precipitate with dil. H_2SO_4

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4. Match the compounds given in column I with their uses mentioned in column II.

Column I		Column II	
A)	$CaCO_3$	p)	Dentistry, ornamental work
B)	$Ca(OH)_2$	q)	Manufacture of sodium carbonate from caustic soda
C)	CaO	r)	Manufacture of high quality paper
D)	$CaSO_4$	s)	Used in white washing

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5. Match the compounds given in column I with their uses mentioned in column II.

	Column I		Column II
A)	Used as a source of O_2 in submarines, space shuttles and oxygen masks	p)	$Mg(ClO_4)_2$
B)	Used in obtaining the X-ray of the stomach	q)	CaH_2
C)	Used as a drying agent	r)	KO_2
D)	Reacts with water to produce H_2	s)	$BaSO_4$

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6. Match the compounds given in column I with their uses mentioned in column II.

	Column I		Column II
A)	Flame colouration	p)	$Be(OH)_2$
B)	Amphoteric character	q)	K
C)	Soluble in organic solvents	r)	$BeCl_2$
D)	Forms superoxide on heating with oxygen	s)	LiCl

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7. Match the compounds given in column I with their uses mentioned in column II.

	Column I		Column II
A)	$CaCO_3$	p)	Pink-violet flame colouration
B)	K_2CO_3	q)	Gives CO_2 on heating
C)	$BaCO_3$	r)	Insoluble in water but dissolves in presence of CO_2
D)	$NaHCO_3$	s)	Gives precipitate with dil. H_2SO_4

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Level Iii Statement Type

1. Statement 1 : Potassium and caesium are useful as electrodes in photoelectric cells.

Statement 2 : Potassium and caesium, when irradiated with light, the light energy absorbed is sufficient to eject out the electron from a atom.

A. Statement 1 is True, statement 2 is True , Statement 2 is 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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2. Statement 1 , Among the alkali metals, caesium salts exhibit the maximum electrical conductance in aqueous solutions.

Statement 2 : The radius of hydrated caesium ion is the highest among alkali metals.

A. Statement 1 is True, statement 2 is True , Statement 2 is 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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3. Assertion : The mobility of sodium ion is lower than that of potassium ion.

Reason : The ionie mobilities depend upon the effective radius of the ion.

A. Statement 1 is True, statement 2 is True , Statement 2 is 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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4. Statement 1 : Calcium and magnesium oxides are not reduced by carbon.

Statement 2 : Calcium and magnesium oxides react with carbon to form their respective carbides.

A. Statement 1 is True, statement 2 is True , Statement 2 is 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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5. Statement 1 : Setting of cement is an endothermic process.

Statement 2 : It involves dehydration of calcium aluminates and calcium silicates.

A. Statement 1 is True, statement 2 is True , Statement 2 is 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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Level Iii Linked Comprehension Type

1. The radius of which of the hydrated ion is the highest?

A. $Li^{\oplus}_{(aq)}$

B. $Na^{\oplus}_{(aq)}$

C. $K^{\oplus}_{(aq)}$

D. $Rb^{\oplus}_{(aq)}$

Answer: A

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2. The ionic mobility $Li^{\oplus}$ of is less than that of the $Na^{\oplus}$ ion in solution because

A. $Li^{\oplus}$ ion has a high charge density

B. $Li^{\oplus}$ ion has the lower hydration tendency

C. $Li^{\oplus}$ ion has the highest ionisation enthalpy

D. $Li^{\oplus}$ has two electrons

Answer: A

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3. Which of the following is the strongest reducing agent.

A. Li

B. Na

C. K

D. Rb

Answer: A

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4. Among the nitrate of alkali metals which one can be decomposed to its oxide?

A. $NaNO_3$

B. KNO_3

C. $LiNO_3$

D. All of these

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 cannot be hydrolysed

D. All of these

Answer: D

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7. Paragraph III

Lithium forms monoxide only when heated in oxygen. Sodium forms monoxide and peroxide in excess of oxygen. Other alkali metals form superoxide with oxygen ie, MO_2 The abnormal behaviour of lithium is due to small size. The larger size of nearer alkali metals also decides the role in formation of superoxides. The three ions are related to each other as follows:

$$\underset{\text{Oxide ion}}{O^{2-}} \xrightarrow{1/2O_2} \underset{\text{Peroxide ion}}{O_2^{2-}} \xrightarrow{O_2} \underset{\text{Superoxide ion}}{2O_2^-}$$

All the three ions abstract proton from water.

A. M cannot be Li and Na

B. M connot be Cs and Rb

C. M cannot be Li and Rb

D. none of these

Answer: A

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8. Consider the following reaction : $M + O_2 \rightarrow \underset{\text{superoxide}}{MO_2}$ (M = alkali metal)

Select the correct statement :

A. Na_2O_2

B. KO_2

C. Na_2O

D. Cs_2O_2

Answer: B

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9. In hydrolysis, the alkali metal oxides , peroxides and superoxides , act as :

A. Bronsted acid

B. Bronsted base

C. Lewis acid

D. Lewis base

Answer: B

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