



CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

THE ALKALI METALS

Mcq

1. Alkali metals never occur free in nature because

- A. they are unstable
- B. they are very reactive chemically
- C. their compounds with other elements are very stable
- D. none of these.

Answer: B



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2. Which of the following statement about the isolation of alkali metals is true ?

- A. Alkali metals can be isolated by the reduction of their oxides by carbon
- B. Alkali metals can be prepared from their aqueous salt solutions by metal displacement method
- C. Alkali metals can be prepared by the electrolysis of their aqueous salt solutions
- D. Alkali metals can be prepared by electrolysis of their fused chlorides.

Answer: D



3. Alkali metals are generally prepared by

- A. reduction of metal oxides with carbon
- B. electrolysis of their anhydrous molten halides
- C. reduction of halides with hydrogen
- D. reduction of corresponding oxide with powdered aluminium.

Answer: B



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4. The sodium metal is prepared by

- A. Electrolysis of aqueous solution of NaCl
- B. Electrolysis of aqueous solution of NaOH
- C. Electrolysis of molten NaCl
- D. none of these.

Answer: C



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5. Hot sodium hydroxide when treated with chlorine gives

A. Sodium chloride and water

B. Sodium chlorate and water

C. Sodium chloride, sodium chlorate and water

D. None of the above.

Answer: C



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6. The alkali metals have an outer electronic configuration of

A. ns^2

B. ns^2np^2

C. ns^1

D. ns^2np^1 .

Answer: C



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7. Which of the following sets of atomic numbers belongs to that of alkali metals?

A. 1, 12, 30, 4, 62

B. 37, 19, 3, 55

C. 9, 17, 35, 53

D. 12, 20, 56, 88.

Answer: B



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8. Which of the following electronic configuration in the outermost two shells is characteristic of the alkaline earth metals?

A. $(n - 1)s^2p^6ns^1$

B. $(n - 1)s^2p^6d^{10}ns^1$

C. $(n - 1)s^2p^6ns^2np^1$

D. $(n - 1)s^2p^6np^1$.

Answer: A



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9. The element with atomic number 55 belongs to which block of the periodic table

A. s-block

B. p-block

C. d-block

D. f-block.

Answer: A



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10. The decrease in melting and boiling points of alkali metals with rise in atomic number is due to

- A. the weakening covalent bonding
- B. weak ionic bonding
- C. van der Waal's forces
- D. the weakening of the metallic bonding.

Answer: D



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11. Which of the following sodium halides has the highest melting point ?

A. NaF

B. NaCl

C. NaBr

D. NaI.

Answer: A



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

A. LiF

B. NaCl

C. KBr

D. CsI.

Answer: D



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13. The alkali metal having low melting point is

A. Fr

B. Cs

C. Rb

D. Na.

Answer: A



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14. The lightest metal known is

A. Beryllium

B. Lithium

C. Sodium

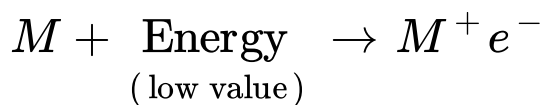
D. Boron.

Answer: B



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15. The reaction of alkali metals as given below shows that they are



- A. strongly electronegative
- B. strongly electropositive
- C. strongly ionic in character
- D. weakly electropositive.

Answer: B



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16. Alkali metals have very small value of electronegativity. The electronegativity down the group

A. increases

B. decreases

C. remains same

D. none of these.

Answer: B



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17. Alkali metals when exposed to air tranish quickly due to the

A. formation of their hydroxides

B. formation of their carbonates

C. formation of their oxides

D. all the above.

Answer: D



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18. Alkali metal halides except Li are soluble in water showing that they are

- A. ionic compounds
- B. covalent compounds
- C. complex compounds
- D. coordinate compounds.

Answer: A



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19. Caesium forms chiefly ionic compounds because

- A. the valence electrons are poorly bound to the nucleus
- B. its electronegativity is very high
- C. its ionization energy is very low
- D. the polarizability of the cation is high.

Answer: C



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20. The largest ionic radii in water is of

A. K^+

B. Cs^+

C. Na^+

D. Li^+ .

Answer: D



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21. Alkali metals in each period have

A. Smallest size

B. Lowest ionization energy

C. Highest electron affinity

D. Highest electronegativity.

Answer: B



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22. The metallic lustre exhibited by sodium is explained by the presence of

A. free protons

B. Na^+ ions

C. Conduction electrons

D. a body-centred cubic lattice.

Answer: C



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23. In alkali metals family caesium should be

A. the least ionizable

B. more electropositive than francium

C. lightest of all

D. having low melting and boiling points.

Answer: D



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24. Pick out the false statement :

A. The electropositive character of alkali metals decreases with increase in atomic number

- B. Lithium is a hard metal and cannot be cut with a knife
- C. Alkali metals are strong reducing agents
- D. The electronegativities of all alkali metals remain the same.

Answer: A



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25. The outermost electron is most loosely held in

A. Li

B. Na

C. K

D. Rb.

Answer: D



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26. Which of the alkali metals has the polarizing power close to that of Magnesium ?

A. Rb

B. K

C. Na

D. Li.

Answer: D



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27. Which of the following statement is not true to explain that first member in a group differs in

many respects from other members of its group
?

- A. Small size
- B. High electronegativity
- C. Nonavailability of d-orbitals for bonding
- D. Similar ionic charges.

Answer: D



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28. Which one of the following statements about alkali metals and their compounds is correct ?

A. Caesium is used in photoelectric cells

B. Molten sodium chloride on electrolysis
give sodium at the anode and chlorine at
the cathode

C. Alkali metal atom has the smallest size in
its period

D. Alkali metals do not react with water.

Answer: A



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29. The alkali metal used in photoelectric cell is

A. Na

B. Cs

C. Rb

D. Fr

Answer: B



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30. Which of the following alkali metal ions in aqueous solution is the best conductor of electricity?



Answer: C



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31. Sodium ordinarily does not show an oxidation state of $+2$, because of its

- A. high first ionization energy
- B. high second ionization energy
- C. large ionic radius
- D. high electronegativity.

Answer: B



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32. Caesium oxide will be

A. Acidic

B. Basic

C. Weakly basic

D. Amphoteric.

Answer: B



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33. Which of the following metals is kept wrapped in paraffin wax ?

A. Li

B. Na

C. C

D. K.

Answer: A



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34. Sodium metal is kept under

A. Kerosene oil

B. Alcohol

C. Water

D. Acids.

Answer: A



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35. In a period, the electronegativity and ionization energy of alkali metal is

A. maximum

B. minimum

C. intermediate

D. equal to that of halogens.

Answer: C



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36. The carbonate of which of the following is insoluble in water

A. Sodium

B. Potassium

C. Lithium

D. Caesium.

Answer: C



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37. The most dangerous method of preparing hydrogen would be by the action of HCl on

A. Zn

B. K

C. Fe

D. Al.

Answer: B



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38. Which of the following statements is false for alkali metals ?

- A. Li^+ is exceptionally small
- B. Sodium is amphoteric in nature
- C. Lithium is the strongest reducing agent
- D. All alkali metals give blue solution in liquid ammonia.

Answer: B



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39. Which of the following statements concerning alkali metals is true ?

- A. They are powerful oxidation agents
- B. They are powerful reducing agents
- C. They have no oxidising or reducing property
- D. They are both oxidising and reducing agents.

Answer: B



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40. The alkali metals are chemically similar because

- A. their valence shell electrons are equally energetic
- B. their outermost electrons have the same principal quantum number
- C. their valence shell electronic configuration is same
- D. their atomicity is one.

Answer: C



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41. Which of the following is a wrong statements ?

A. Potassium reacts vigorously with water and gives alkaline solution with the liberation of hydrogen gas

B. The alkali metal hydroxides are strong bases because they ionize completely in

dilute aqueous solutions

C. Potassium carbonate cannot be prepared

by Solvay process

D. Lithium chloride is insoluble in alcohol but

soluble in water.

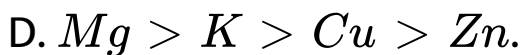
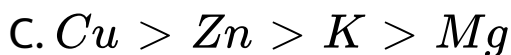
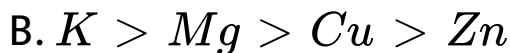
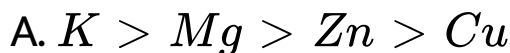
Answer: D



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42. Which of the following is the correct order of chemical reactivity with water according to

electrochemical series ?



Answer: A



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

A. NaNH_2

B. Sodium ions

C. Sodium hydride

D. Solvated electrons.

Answer: D



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44. Alkali metals dissolve in ammonia to give a blue solution which is conducting due to

A. ammoniated electrons

B. loss of electrons

C. ammoniated cations

D. both (A) and (C).

Answer: D



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45. When sodium is dissolved in pure liquid ammonia along with H_2 , the other product is

A. Sodium

B. Sodium amide

C. Sodium ammoniate

D. Sodium tetra-ammoniate.

Answer: B



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46. The reaction of sodium is highly exothermic with water. The rate of reaction is lowered by

- A. mixing with alcohol
- B. mixing with acetic acid
- C. making an amalgam
- D. lowering the temperature.

Answer: C



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47. Alcohol dissolves

- A. KCl

B. NaCl

C. LiCl

D. RbCl.

Answer: C



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48. The ionic conductance is least for which of the following cation-

A. Cs^{+}

B. Rb^{+}

C. K^{+}

D. Na^{+}

Answer: D



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49. The metal which is best reducing agent/has lowest reduction potential amongst the following in the aqueous solution is

A. Na

B. K

C. Rb

D. Li.

Answer: D



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50. If NaOH is added to an aqueous solution of Zn^{+2} ions white precipitate appears and on adding excess NaOH, the precipitate dissolves. In solution zinc is in the

- A. Cationic part
- B. Anionic part
- C. Both in cationic and anionic parts
- D. There is no zinc left in the solution.

Answer: B



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51. When $NaBH_4$ is dissolved in water

- A. it decomposes with the evolution of H_2

B. Na^+ and BH_4^- are formed which are stable

C. BH_4^- ions formed initially decompose to produce OH^- ions, which prevent further decomposition

D. NaH and B_2H_6 are produced.

Answer: C



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52. $LiAlH_4$ is obtained by reacting an excess of... With an ethereal solution of $AlCl_3$

A. LiCl

B. LiH

C. Li

D. LiOH.

Answer: B



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53. Alkali metal hydrides react with water to give

- A. Acidic solution
- B. Basic solution
- C. Neutral solution
- D. Hydride ion.

Answer: B



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54. Amongst the alkali metal hydrides, the most stable one is

A. LiH

B. NaH

C. KH

D. RbH.

Answer: A



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55. Ionic hydrides are usually

- A. good electrically conductors when solid
- B. easily reduced
- C. good reducing agents
- D. liquid at room temperature.

Answer: C



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56. The oxide of which metal is most stable to heat :

A. Ag

B. K

C. Hg

D. none of these.

Answer: B



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57. Which out of the following compounds is the most stable ?

A. LiCl

B. LiF

C. LiBr

D. LiI.

Answer: B



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58. Alkali metal oxides are soluble in

A. Carbon tetrachloride

B. Benzene

C. Water

D. Kerosene oil.

Answer: C



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59. In the reaction $M + O_2 \rightarrow MO_2$ (superoxide) the metal M is

A. Li

B. Na

C. K

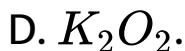
D. Ba.

Answer: C



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

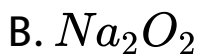


Answer: C



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61. Which of the following oxides is formed on burning sodium in oxygen ?



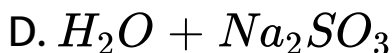
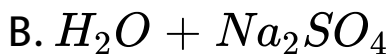
Answer: B



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62. Sodium peroxide on treatment with cold dil.

H_2SO_4 gives

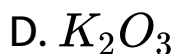


Answer: C



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63. One among the following oxides cannot be formed



Answer: C



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64. Superoxides of type MO_2 are formed by all except

A. Li

B. Ca

C. Rb

D. Ba.

Answer: A



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65. Which of the following decomposes on heating ?

A. LiOH

B. NaOH

C. KOH

D. CsOH .

Answer: A



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66. The strongest base among the following will be

A. LiOH

B. NaOH

C. KOH

D. RbOH.

Answer: D



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67. Which of the following is the weakest base ?

A. NaOH

B. KOH

C. $Zn(OH)_2$

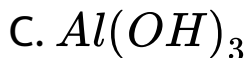
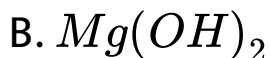
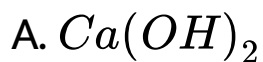
D. $Ca(OH)_2$.

Answer: C



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68. Which of the following is a weak hydroxide ?



Answer: A



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69. On strong heating sodium bicarbonate changes into

A. Sodium monoxide

B. Sodium hydroxide

C. Sodium carbonate

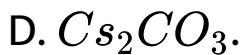
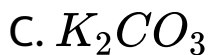
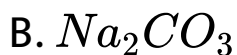
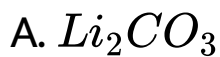
D. Sodium peroxide.

Answer: C



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70. Which of the following alkali metal carbonate is the least stable and decomposes readily

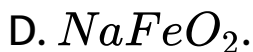
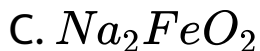
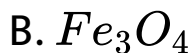
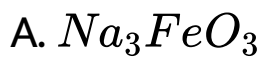


Answer: A



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71. $Na_2CO_3 + Fe_2O_3 \rightarrow A + CO_2$, what is A in the reaction ?

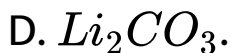
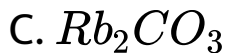
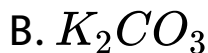
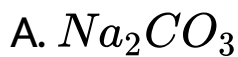


Answer: D



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72. Which of the following alkali metal carbonates gives CO_2 on heating as well as on treating with acids ?



Answer: D



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73. The addition of Na_2CO_3 to the aqueous solution of an oxide produces CO_2 . This indicate that the

- A. oxide is basic
- B. oxide is amphoteric
- C. oxide is that of a metal
- D. oxide is that of a non metal.

Answer: D



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74. Sodium carbonate is alkaline due to

- A. hydrolysis of both Na^+ and CO_3^{-2} ions

B. hydrolysis of Na^+ ion

C. hydrolysis of CO_3^{2-} ion

D. none of these.

Answer: C



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75. The pair of compounds which cannot exist together in aqueous solution is

A. Na_2CO_3 and $NaHCO_3$

B. NaHCO_3 and NaOH

C. NaOH and NaH_2PO_4

D. Both (B) and (C).

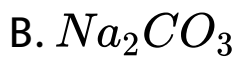
Answer: D



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76. When ammoniacal solution of common salt is saturated with carbon dioxide, we obtain

A. $(\text{NH}_4)_2\text{CO}_3$

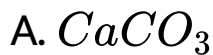


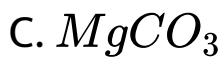
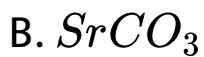
Answer: C



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77. Which of the following is thermally most stable ?



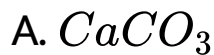


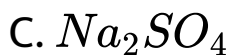
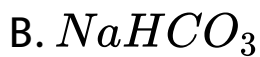
Answer: D



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78. Which of the following carbonates is least soluble in water ?



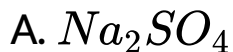
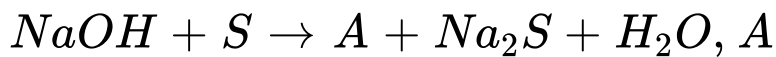


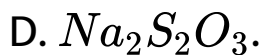
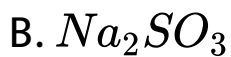
Answer: A



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79. In the following reaction





Answer: D



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80. The alkali metal that can react directly with carbon to form ionic carbide is



B. Rb

C. K

D. Li.

Answer: D



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81. Which of the following is not attacked by hot sodium hydroxide solution ?

A. Silicon

B. Carbon

C. Tin

D. Lead.

Answer: B



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82. The non metal which is not affected by caustic soda is

A. Carbon

B. Silicon

C. Sulphur

D. Phosphorus.

Answer: A



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83. A combustible gas is liberated when caustic soda solution is heated with

A. NH_4Cl

B. I_2

C. Zn

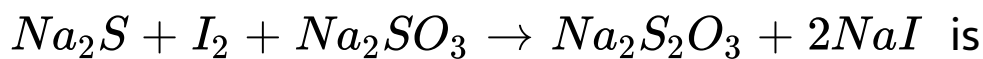
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Answer: C



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84. The reaction



called

A. Springs Reaction

B. Friedal craft reaction

C. Blanc reduction

D. Solvay reaction.

Answer: A



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85. Which one is not a mineral of sodium ?

A. Rock salt

B. Chile saltpetre

C. Cyrolite

D. Petalite.

Answer: D



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86. The ion which has the maximum value of hydration energy is

A. Li^{+}

B. Na^{+}

C. K^+

D. Cs^+

Answer: A



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

A. Na

B. K

C. Li

D. Rb.

Answer: B



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88. Microcosmic salt reacts with coloured ions to form characteristic bead which is due to formation

A. Borates

B. Metaphosphates

C. Metaborates

D. Phosphates.

Answer: B



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89. Metal used for dying organic solvents is

A. Fe

B. Pt

C. Mg

D. Na.

Answer: D



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90. Hypo is the aqueous solution of

- A. Sodium chloride
- B. Silver bromide
- C. Sodium thiosulphate
- D. Sodium sulphate.

Answer: C



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91. The ashes of plants contain Alkali metal, 90 % of which is

A. K

B. Li

C. Cs

D. Ca.

Answer: A



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92. Which of the following is the most abundant alkali metal (in combined state) in nature ?

A. K

B. Li

C. Cs

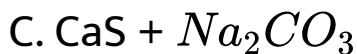
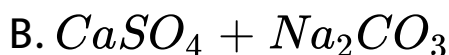
D. Na.

Answer: D



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93. Black ash is



Answer: C



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94. The salt added to table salt to make it flow freely in rainy reason is

A. KCl

B. NH_4Cl

C. $Ca_3(PO_4)_2$

D. $NaHCO_3$.

Answer: C



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95. A solution of KOH in water is called

A. Potash lye

B. Soda lye

C. Caustic Potash alcoholic

D. Salt cake.

Answer: A



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96. Caustic soda is

A. Effluorescent

B. Deliquescent

C. Oxidant

D. Reductant.

Answer: B



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97. The name Oxone is given to

A. Ozone

B. Sodamide

C. Sodium peroxide

D. Sodium oxide.

Answer: C



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98. Sodium when dropped in water catches fire because

- A. it has higher atomic mass
- B. it is a metal
- C. it is highly electropositive in nature
- D. the hydrogen gas evolved in the reaction is combustible in nature.

Answer: D



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99. Which one of the following alkali metals emit light of longest wavelength in the flame test ?

A. Na

B. Li

C. K

D. Cs.

Answer: B



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100. Solid sodium chloride is a bad conductor of electricity because

A. solid NaCl is covalent

B. in solid NaCl there are no ions

C. in solid NaCl, electrons are localised

between Na^+ and Cl^- ions

D. Na^+ and Cl^- in solid NaCl are not free to move.

Answer: D



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101. In Castner-Kellner cell, sodium hydroxide is formed in the central compartment.

A. Gold

B. Silver

C. Iron

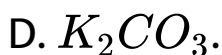
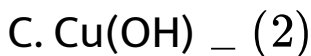
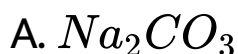
D. Mercury.

Answer: C



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102. A colourless salt colours a bunsen flame golden yellow and also turns moistened litmus paper blue. The substance is



Answer: A



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103. Sodium metal cannot be stored in

A. CCl_4

B. Kerosene

C. Thiocarbonate

D. Alcohol.

Answer: D



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104. K_2CS_3 is called Potassium

A. sulphocyanide

B. Thiocarbide

C. Thiocarbonate

D. Thiocyanate.

Answer: C



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105. Potassium was first isolated by

A. Davy

B. Arfvedson

C. Plattner

D. None.

Answer: A



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106. Considering greater polarization in LiCl compared to that in NaCl, which of the following statements you would expect to be wrong ?

A. LiCl has lower melting point than NaCl

B. LiCl dissolves more in organic solvents than NaCl

C. LiCl will ionize in water more than NaCl

D. Fused LiCl would be less conducting than fused NaCl.

Answer: D



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107. Among the statements mentioned below which one is not helpful in explaining the

diagonal relationship

- A. similarity in ionic sizes
- B. same charge to size ratio
- C. constancy in ionisation energy
- D. similarity in chemical reaction.

Answer: A



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108. Make the incorrect statement about lithium

- A. Lithium metal is not affected by air
- B. When burnt in oxygen, lithium metal form superoxide, LiO_2
- C. Lithium combines with nitrogen directly to form lithium nitride
- D. Lithium has great tendency to form hydrates.

Answer: B



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109. Among the alkali metals, the lithium salts are the poorest conductors of electricity in aqueous solution because of

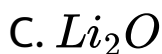
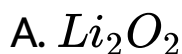
- A. easy diffusion of Li ions
- B. lowest ability to polarise water molecule
- C. lowest charge to radius ration of Li
- D. highest degree of hydration.

Answer: D



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110. Which of the following compounds will be formed, when Lithium is heated with excess of oxygen ?



Answer: C



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111. Point out the incorrect statement about lithium in the following

- A. It is softer than other alkali metals
- B. It possesses higher melting and boiling points
- C. It is least reactive
- D. It forms chloride which is soluble in alcohol.

Answer: A



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112. Chemistry of lithium is similar to that of magnesium even though they are placed in different group because

- A. both are found together in nature
- B. the ratio of their charge to size is nearly the same
- C. both have nearly same size
- D. both are metallic in nature.

Answer: B



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113. LiOH is

- A. a weak base
- B. a strong base
- C. an amphoteric compound
- D. an acid compound.

Answer: A



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D. none of these.

Answer: C



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A. O_2

B. NO_2

C. $O_2 + NO_2$

D. none of these.

Answer: A



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116. The chloride of one of the following form a hydrate

A. Li

B. Na

C. Cs

D. Rb.

Answer: A



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117. The only oxidation state of alkali metals in their compounds is

A. +1

B. +2

C. -1

D. zero.

Answer: A



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118. The alkali metal that reacts with nitrogen directly to form nitride is

A. Na

B. K

C. Pb

D. Li.

Answer: D



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119. When sodium reacts with excess of oxygen, oxidation number of oxygen changes from

A. $0 - 1$

B. $0 - 2$

C. -1 to -2

D. $+1$ to -1 .

Answer: A



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120. Which of the following has maximum tendency to form complexes ?

A. K

B. Rb

C. Na

D. Li.

Answer: D



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121. Sodium ordinarily does not show an oxidation state of $+2$, because of its

A. Large ionic radius

B. High IE_1

C. High IE_2

D. High EA.

Answer: C



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122. Which of the following alkali metal ions in aqueous solution is the best conductor of electricity ?



Answer: D



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123. Which of the following does not illustrate the anomalous behaviour of lithium ?

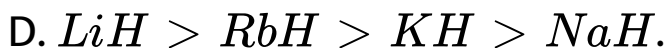
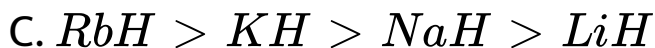
- A. Lithium reacts with nitrogen to form a nitride
- B. Lithium is the hardest alkali metal
- C. Lithium reacts with oxygen to form normal oxide
- D. $LiCO_3$ decomposes on heating.

Answer: B



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124. The correct order of stability of hydrides of alkali metals is



Answer: A



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125. When potassium superoxide is dissolved in water, the products obtained are

- A. KOH and H_2O_2
- B. KOH, H_2O_2 and O_2
- C. KOH and O_2
- D. KOH, and H_2O_2 and O_2 .

Answer: B



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126. When $NaCl$ is dissolved in water the sodium ion becomes

- A. Oxidized
- B. Reduced
- C. Hydrolysed
- D. Hydrated

Answer: D



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127. In Drown's process for the manufacture of sodium metal, $CaCl_2$ is added to NaCl in order to

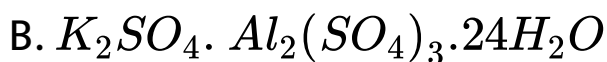
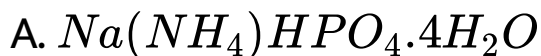
- A. increase ionization of NaCl
- B. increase in melting point of NaCl
- C. decrease in the melting point of NaCl
- D. increase in the conductance of electrolyte.

Answer: C



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128. The salt used for performing bead test in inorganic qualitative analysis is



Answer: A



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129. Electrochemical process (electrolysis of fused salt) is employed to extract

A. Iron

B. Mg

C. Na

D. Both Na and Mg.

Answer: D



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130. A silverly white metal, lighter than water can be produced only by the electrolysis of its fused chloride, with great difficulty. It is the sixth most abundant metal of earth crust. The metal is used in Wurtz reaction, Wurtz-Fitting reaction and Birch reduction. The metal is

A. K

B. Mg

C. Na

D. Ca.

Answer: C



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131. On heating sodium metal in a current of ammonia the compound formed is

- A. Sodium nitride
- B. Sodium hydride
- C. Sodium amide
- D. Sodium azide.

Answer: C



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132. The starting material used in Solvay's process are

- A. Sodium sulphate
- B. Brine solution
- C. Carnallite
- D. All of them together.

Answer: B



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133. When NaOH pallets are left in the open air they acquire a fluid layer around each crystal as

- A. they start melting
- B. they absorb moisture from air
- C. they react with air to form a liquid compound
- D. they absorb CO_2 from air.

Answer: B



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134. In Solvay's process _____ is obtained as by-product.

- A. Ammonia
- B. Carbon dioxide
- C. Calcium chloride
- D. Quick lime.

Answer: C



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135. Which is a by-product in Solvay's process ?

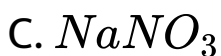
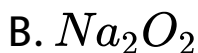
- A. Cl^- is oxidised at anode
- B. Cl^- is reduced at anode
- C. Cl^- is oxidised at cathode
- D. Cl^- is neither reduced nor oxidised.

Answer: A



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136. Which one of the following acts as a reducing as well as oxidising agent ?



Answer: B



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137. Pure sodium chloride is prepared by saturating a cold saturated solution of common salt in water with HCl gas. The principle used is

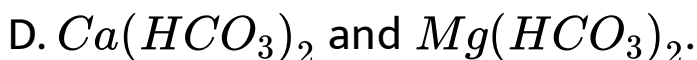
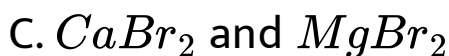
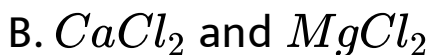
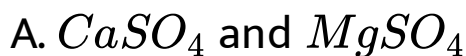
- A. Dillution law principle
- B. Displacement law
- C. The common ion effect
- D. Fraction distillation.

Answer: C



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138. Crude common salt is hygroscopic because of impurities of



Answer: B



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139. The yellow light used for illumination is from

A. Mercury vapour lamp

B. Sodium vapour lamp

C. Neon gas lamp

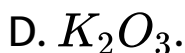
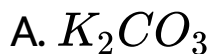
D. None of these.

Answer: B



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140. Which of the following compound of potassium is known 'as pearl ash' ?



Answer: A



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141. Chemical name of soda ash is

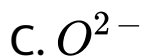
- A. sodium carbonate
- B. Sodium bicarbonate
- C. Sodium hydroxide
- D. None of these.

Answer: A



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142. In the electrolytic process for the manufacture of NaOH from NaCl solution, the ion discharged at the anode is



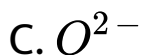
D. All the these.

Answer: A



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143. In the electrolysis of NaCl solution for the manufacture of NaOH by Caster Kellner cell, the ion discharged at the cathode is



D. None of these.

Answer: A



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144. The composition of common baking powder is

- A. Starch, sodium carbonate, acetic acid
- B. Sodium bicarbonate, hydrochloric acid
- C. Starch, sodium bicarbonate, citric acid
- D. Starch, sodium bicarbonate, potassium hydrogen tartrate.

Answer: D



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145. Li and Na metals are prepared electrolytically because

A. Their salts are good conductors of electricity in liquid state

B. Their salt solutions conduct electricity easily

C. These metals themselves being stronger reducing agents, cannot be reduced by other reductants

D. Their salts can be fused easily.

Answer: C



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146. Alkali metals never occur free in nature because

- A. they are unstable
- B. Their chemical activity is very high
- C. Their compounds with other elements are highly stable
- D. None of these.

Answer: B



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147. In the Down's method for the extraction of sodium, the melting point of the electrolyte is lowered by adding:-

A. Potassium chloride

B. Calcium chloride

C. Both calcium chloride and potassium fluoride

D. Potassium fluoride only.

Answer: C



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148. Which of the following statement about the isolation of alkali metals is true ?

A. Na and K metals can be isolated by the reduction of their oxides

B. Na and K metals can be prepared from their aqueous salt solutions by metal displacement method

C. Na and K metals can be prepared by the electrolysis of their aqueous salt solutions

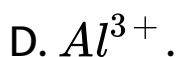
D. Na and K metals can be prepared by the electrolysis of their fused chlorides.

Answer: D



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149. Which of the following ion forms a hydroxide highly soluble in water ?



Answer: B



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150. Alkali metal(s) which can be produced by metal displacement method is (are)

A. Li

B. K

C. Rb

D. Na.

Answer: A::B::C



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151. Which of the following alkali metals form complex hydrides?

A. Li

B. K

C. Na

D. Rb.

Answer: A::C



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152. Aqueous solution of KI dissolves I_2 to form KI_3 . Which of the following statements is (are) true ?

- A. The solution contains K^{3+} and I^- ions.
- B. The solution contains K^+ and I_3^- ions.
- C. The solution is violet in colour.
- D. In KI_3 , I_2 behaves as Lewis acid and I^- as Lewis base.

Answer: B::C::D



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153. The statement(s) not correct about lithium is (are)

- A. Lithium is least reactive of all alkali metals.
- B. It is the weakest reducing agent among all alkali metals
- C. It forms no acetylides with acetylene.
- D. $LiHCO_3$ is a white crystalline solid.

Answer: B::D



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154. Alkali metal iodide(s) aqueous solution(s) of which can dissolve I_2 to form MI_3 is (are)

A. K

B. Na

C. Rb

D. Cs.

Answer: A::C



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155. Compound(s) of Na insoluble in water at room temperature (is) are

A. Glauber's salt

B. zeolite

C. Sodium hexacyanoferrate

D. Sodium hexahydroxoantimonate.

Answer: B::D



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156. The colour of the solution of alkali metal in ammonia can be

A. blue

B. violet

C. bronze like

D. red.

Answer: A::C



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157. Alkali metals are characterised by

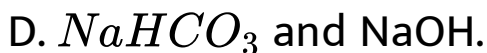
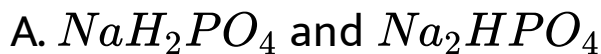
- A. Good conductor of heat and electricity
- B. High oxidation potential
- C. High melting point
- D. Solubility in liquid ammonia.

Answer: A::B::D



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158. The pair of compounds which cannot exist together in aqueous solution are



Answer: C::D



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159. Highly pure dilute solution of sodium in liquid ammonia

- A. Shows blue colour
- B. exhibits electrical conductivity
- C. produces sodium amide
- D. produces hydrogen gas.

Answer: A::B



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

- A. Sodium atoms
- B. Sodium hydride
- C. Sodium amide
- D. Solvated electrons.

Answer: D



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161. Molten sodium chloride conducts electricity due to the presence of

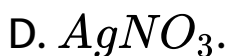
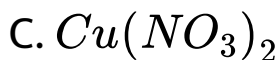
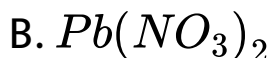
- A. free electrons
- B. free ions
- C. free molecules
- D. atoms of sodium and chlorine.

Answer: B



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162. Nitrogen formula of Glauber's salt is

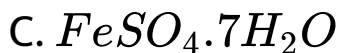


Answer: A



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163. Molecular formula of Glauber's salt is



Answer: D



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164. The pair of compounds which cannot exist together in solution is

A. NaHCO_3 and NaOH

B. NaHCO_3 and H_2O

C. NaHCO_3 and Na_2CO_3

D. Na_2CO_3 and NaOH .

Answer: A



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165. The metallic lustre exhibited by sodium is explained by

- A. Diffusion of sodium ions
- B. Oscillation of loose electrons
- C. Excitation of free protons
- D. Existence of body centred cubic lattice.

Answer: B



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166. An aqueous solution of sodium sulphate is electrolysed using inert electrodes. The products at the cathode and anode are respectively

A. H_2 , O_2

B. O_2 , H_2

C. O_2 , Na

D. O_2 , SO_2 .

Answer: A



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167. Sodium sulphate is soluble in water but barium sulphate is sparingly soluble because

- A. The hydration energy of Na_2SO_4 is more than its lattice energy while the lattice energy of $BaSO_4$ is more than its hydration energy
- B. The lattice energy has no role to play in solubility
- C. the lattice energy of Na_2SO_4 is more than its hydration energy
- D. None of these.

Answer: A



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168. Which of the following statements is correct for $CsBr_3$?

- A. It is a covalent compound
- B. It contains Cs^{3+} and Br^{-} ions
- C. It contains Cs^{+} and Br_3^{-} ions
- D. It contains Cs^{+} , Br^{-} and Br_2 molecule.

Answer: C



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169. The pair of compounds which cannot exist together is

A. NaHCO_3 and NaOH

B. Na_2CO_3 and NaHCO_3

C. Na_2CO_3 and NaOH

D. NaHCO_3 and NaCl .

Answer: A



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170. Among KO_2 , AlO_2^- , BaO_2 and NO_2^+ , unpaired electrons is present in

A. NO_2^+ and BaO_2

B. KO_2 and AlO_2^-

C. KO_2 only

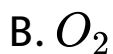
D. BaO_2 only.

Answer: C



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171. Sodium nitrate decomposes above $800^{\circ}C$ to give



Answer: B



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172. A solution of sodium salt of unknown anion when treated with Magnesium chloride solution gives white precipitate only on boiling. The anion is



Answer: B



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

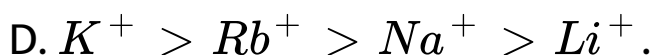
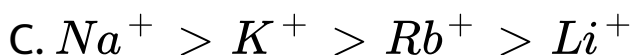
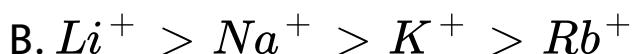
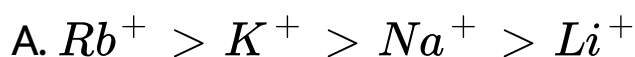


Answer: B



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174. The correct order of mobility of the alkali metal ions in aqueous solution is



Answer: A



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175. The alkali metals form salt like hydrides by the direct synthesis at elevated temperature. The thermal stability of these hydrides decreases in which of the following order



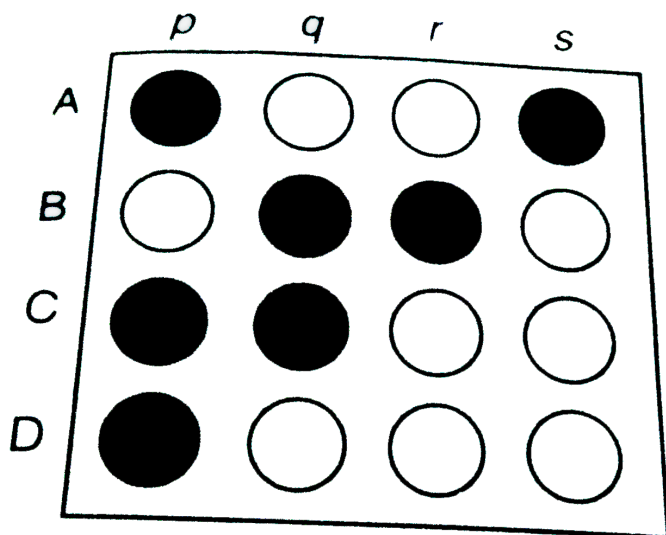
Answer: B



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176. Here each question contains statement given in two columns which have to be matched. Statements in column I are labelled as A, B, C and d. Whereas statements in column II are labelled as p, q, r and s. The answer to these question have to be appropriately bubbled as illustrated in the following example.

If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-p, then the correctly bubbled 4×4 matrix should look like the following.



	Column I		Column II
<i>A</i>	Sodium	<i>p</i>	Metal
<i>B</i>	Potassium	<i>q</i>	s-block
<i>C</i>	calcium	<i>r</i>	Ionic hydride
<i>D</i>	strontium	<i>s</i>	Inert solvent

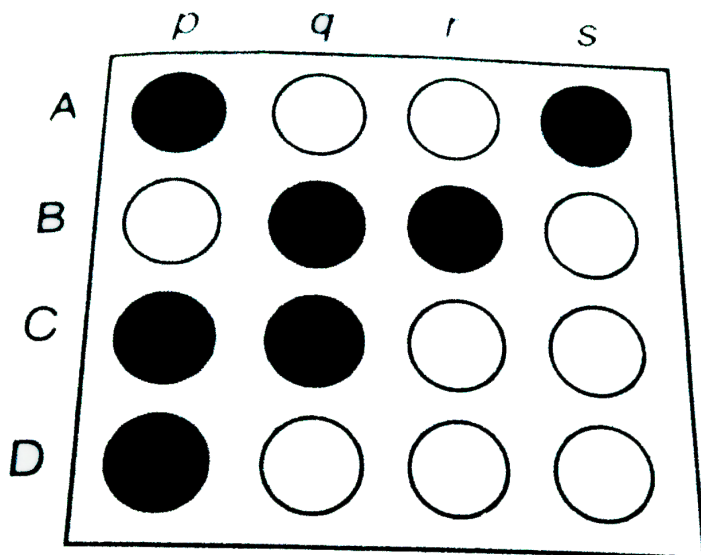


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If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-p, then the correctly bubbled 4×4 matrix should look like the following.



	Column I		Column II
(A)	Plaster of Paris	p	Soluble
(B)	Washing soda	q	Compound of group 2
(C)	Baking soda	r	used in statues, chalk
(D)	Caustic soda	s	Compound of group I



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1. Potassium is kept in

A. Water

B. Ammonia

C. Alcohol

D. Kerosene

Answer: D



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2. A bottle of fire extinguishers contain H_2SO_4 and:

A. $NaHCO_3$ and Na_2CO_3

B. $NaHCO_3$ solution

C. Na_2CO_3

D. $CaCO_3$.

Answer: B



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3. Which halide has highest melting point ?

A. NaCl

B. NaBr

C. NaF

D. NaI.

Answer: C



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4. Leblanc process is employed in the manufacture of

A. Baking soda

B. Washing soda

C. Potash

D. Plaster of paris

Answer: C



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5. Which is manufactured by electrolysis of fused NaCl ?

A. NaOH

B. Na

C. NaClO

D. NaClO_3 .

Answer: B



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6. Which is an ore of potassium ?

A. Carnallite

B. Cryolite

C. Bauxite

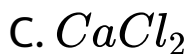
D. Dolomite

Answer: A



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7. Which of the following imparts violet colouration to the non-luminous flame of Bunsen burner ?

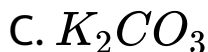
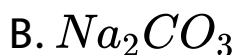
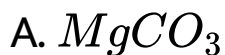


Answer: D



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8. Which of the following carbonates decomposes on heating ?



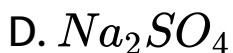
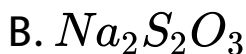
D. All.

Answer: A



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9. Sodium carbonate reacts with SO_2 in aqueous medium to give



Answer: A



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10. Causticisation process is used for the preparation of

- A. Caustic soda
- B. Caustic potash
- C. Baryata solution
- D. Slaked lime.

Answer: A



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11. Which of the following is radioactive ?

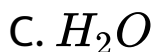


Answer: C



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12. When CO_2 is bubbled into an aqueous solution of Na_2CO_3 the following is formed

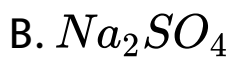
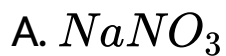


Answer: B



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13. Chill salt petre is

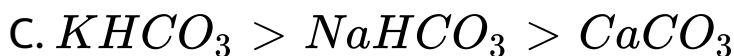
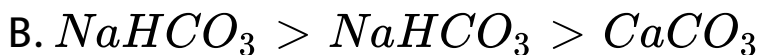


Answer: A



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14. Which of the following are arranged in correct increasing order of solubilities ?



Answer: D



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15. Alkali metals impart colour to Bunsen flame due to

- A. low ionization energies
- B. low melting points
- C. their softness
- D. the presence of one electron in the most shell

Answer: A



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16. Sodium metal cannot be stored under

A. Benzene

B. Kerosene oil

C. Alcohol

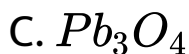
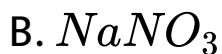
D. Toluene

Answer: C



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17. Which of the following does not liberate O_2 in Bunsen burner ?



Answer: A



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18. When $NaCl$ is dissolved in water the sodium ion becomes

- A. Oxidised
- B. Reduced
- C. Hydrolysed
- D. Hydrated

Answer: D



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19. Among alkali metal salts, the lithium salts are the poorest conductors of electricity in aqueous solution because of

- A. Easy diffusion of Li^+ ions to polarize water molecules
- B. Lowest charge to radius ratio
- C. Lowest charge to radius ratio
- D. Higher degree of hydration of Li^+ ions

Answer: D



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20. Which one of the following properties of alkali metals increases in magnitude as the atomic number rises ?

- A. Ionic radius
- B. Melting point
- C. Electronegativity
- D. First ionization energy.

Answer: A



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21. Which one of the following atoms will have the smallest size ?

A. Mg

B. Na

C. Be

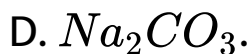
D. Li.

Answer: C



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22. The formula of nitre is



Answer: A



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23. The process associated with sodium carbonate manufacture is known as

A. Chamber

B. Haber

C. Solvay

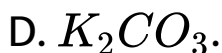
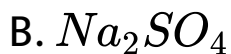
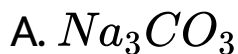
D. Castner.

Answer: C



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24. Baking powder has one of the following constituents



Answer: C



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25. Which of the following alkali metal hydroxides is the strongest base ?

A. LiOH

B. NaOH

C. KOH

D. CsOH.

Answer: D



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26. Compared with the alkaline earth metals, the alkali metals exhibit

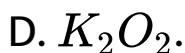
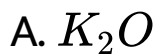
- A. Smaller ionic radii
- B. Highest boiling points
- C. Greater hardness
- D. Lower ionization energies.

Answer: D



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



Answer: C



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28. Which of the following compounds has the lowest anion to cation size ratio ?

A. LiF

B. NaF

C. CsI

D. CsF.

Answer: D



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29. Which of the following has the highest solubility product ?

A. KOH

B. CsOH

C. LiOH

D. RbOH.

Answer: B



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30. The gas evolved on heating Na_2CO_3 is

A. CO_2

B. CO

C. Water vapour

D. No gas.

Answer: D



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31. Which is manufactured by electrolysis of fused NaCl ?

A. NaOH

B. Na

C. NaClO

D. NaClO_3 .

Answer: B



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32. Strongest bond is between

A. CsF

B. NaCl

C. Both (A) and (B)

D. None of these.

Answer: A



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33. The properties of lithium are similar to those of Mg. This is because

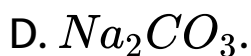
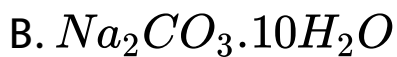
- A. Both have nearly the same size
- B. the ratio of their charge to size is nearly the same
- C. Both have similar electronic configurations
- D. Both are found together in nature.

Answer: A



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34. Washing soda has formula



Answer: B



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35. Potassium metal is commercially prepared by the reduction of molten KCl with metallic sodium at 850°C (1123 K). This method is based upon the following principle

A. Sodium is more reactive than potassium at this temperature

B. Potassium being more volatile distils off thus shifting the reaction forward.

C. Sodium prefers to bind to chloride ions in preference to potassium ions

D. Potassium and sodium form an alloy at this temperature.

Answer: B



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36. Molten sodium chloride conducts electricity due to the presence of:

A. free electrons

B. free ions

C. free molecules

D. atoms of sodium and chlorine.

Answer: B



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37. Which one is the highest melting halide ?

A. NaCl

B. NaBr

C. NaF

D. NaI.

Answer: C



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

A. Sodium atoms

B. Sodium hydride

C. Sodium amide

D. Solvated electrons.

Answer: D



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39. NaCl crystals consist of

A. NaCl molecules

B. Na and Cl atoms

C. Na^{+} and Cl^{+} ions

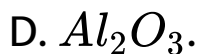
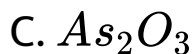
D. Na^{-} and Cl^{+} ions.

Answer: C



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40. Which of the most basic of the following ?

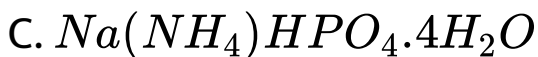


Answer: A



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41. Microcosmic salt is



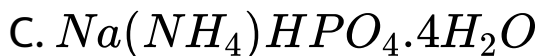
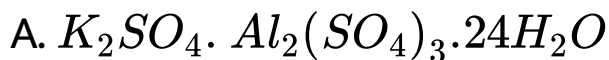
D. None of the above.

Answer: C



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42. Salt used for performing bead test in qualitative inorganic analysis is



Answer: C



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43. Sodium conducts electricity because

- A. It is a soft alkali metal
- B. It has only one electron in the outermost orbit
- C. It has mobile electrons
- D. It gives hydrogen with water.

Answer: C



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44. The following are some of the methods commonly employed for the extraction of metals from their ores. Which of the following methods is generally employed for the extraction of sodium ?

A. Reduction of an oxide with coke

B. Electrolysis of an aqueous solution of a chloride

C. Electrolysis of a molten chloride

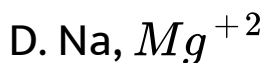
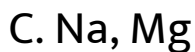
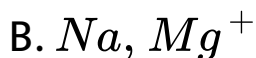
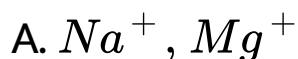
D. Reduction of a chloride with more reactive metal.

Answer: C



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45. Which of the following sets can be called isoelectronic species ?



Answer: B



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46. In the preparation of sodium carbonate (Na_2CO_3) which of the following is used ?

A. Slaked lime

B. Quick lime

C. Lime stone

D. Sodium hydroxide.

Answer: C



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47. The alkali metal that reacts with nitrogen directly to form nitride is

A. Li

B. Na

C. K

D. Rb.

Answer: A



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48. The correct sequence of the alkali metals in the group is

A. Fr, Na, K, Rb, Cs, Li

B. Li, Na, K, Rb, Cs, Fr

C. Na, K, Rb, Cs, Fr, Li

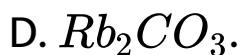
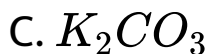
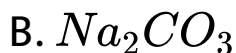
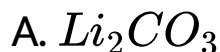
D. Rb, Cs, Li, Na, K.

Answer: B



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49. Which of the following has lowest thermal stability ?



Answer: A



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50. Chloride of an element A gives neutral solution in water. In the periodic table, the elements A belong to

- A. First group
- B. Third group
- C. Fifth group
- D. First transition series.

Answer: A



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

A. The m.p. and b.p. of Li are comparatively high

B. Li forms a nitride Li_3N unlike group 1 metals

C. Li is much softer than the other 1 group metals

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

Answer: C



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52. In Solvay ammonia process, sodium bicarbonate is precipitated due to

A. Presence of NH_3

B. Reaction with CO_2

C. Reaction with brine solution

D. Reaction with $NaOH$.

Answer: C



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53. Sodium reacts with water more vigorously than lithium because

- A. It has higher atomic weight
- B. It is more electronegative
- C. It is more electropositive
- D. It is a metal.

Answer: C



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54. Which one of the following has minimum value of cation/anion ratio ?

A. NaCl

B. KCl

C. $MgCl_2$

D. CaF_2 .

Answer: C



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55. Which of the following has largest size ?

A. Na

B. Na^{+}

C. Na^{-}

D. None of the above.

Answer: C



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56. Which compound will show the highest lattice energy ?

A. RbF

B. CsF

C. NaF

D. KF

Answer: C



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57. Strongest bond is between

A. CsF

B. NaCl

C. Both (A) and (B)

D. None of the above.

Answer: A



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58. Which of the following properties is not true for an alkali metal ?

A. Low atomic volume

B. Low ionization energy

C. Low density

D. Low electronegativity.

Answer: A



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59. Which is the weakest reducing agent ?

A. Li

B. Na

C. K

D. Rb.

Answer: B



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60. Which of the following is known as fusion mixture ?

A. Mixture of $Na_2CO_3 + NaHCO_3$

B. $Na_2CO_3 \cdot 10H_2O$

C. Mixture of $K_2CO_3 + Na_2CO_3$

D. NaHCO_3 .

Answer: C



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61. Which of the following statements is false for alkali metals ?

- A. Lithium is the strongest reducing agent
- B. Sodium is amphoteric in nature
- C. Li^+ is exceptionally small

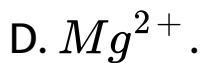
D. All alkali metals give blue solution in liquid ammonia.

Answer: B



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62. The standard reduction potential of Li^+ / Li , Ba^{2+} / Ba , Na^+ / Na and Mg^{2+} / Mg . Are -3.05, -2.73, -2.71 and -2.37 volts respectively which one of the following is strongest oxidising agent?



Answer: D



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63. The reactivity of the alkali metal sodium with water, is made use of

- A. in drying of alcohols
- B. in drying of benzene
- C. in drying of ammonia solution
- D. as a general drying agent.

Answer: B



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

- A. Low ionisation potential of sodium
- B. Photosensitivity of sodium
- C. Sublimation of metallic sodium to give yellow vapour
- D. Emission of energy absorbed as a radiation in the ultraviolet region.

Answer: A



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65. Which of the following imparts violet colouration to the Bunsen burner nonluminous flame ?



Answer: D



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66. A combustible gas is liberated when caustic soda solution is heated with

A. S

B. NH_4Cl

C. I_2

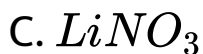
D. Zn.

Answer: D



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67. Which of the following compound is used in gun powder ?



D. None.

Answer: B



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68. Alkali metals displace hydrogen from water forming bases due to the reason that

A. They are far above the hydrogen in electrochemical series based on oxidation potential

B. They are far below the hydrogen in electrochemical series based on oxidation potential

C. Their ionization potential is less than that of other elements

D. They contain only one electron in their outermost shell.

Answer: B



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69. Fires, that result from the combustion of alkali metals can be extinguished by

A. CCl_4

B. Sand

C. Water

D. Kerosene

Answer: A



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70. Caesium oxide will be

A. very strongly basic

B. acidic

C. Weakly basic

D. Amphoteric.

Answer: A



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71. Which of the following statements is false regarding saline hydrides?

- A. In the molten state they conduct electricity
- B. They dissolve in water giving off hydrogen
- C. They are used as reducing agents

D. They are covalent in nature.

Answer: D



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72. The alkali metals

A. forms salt like hydrides

B. form salts which are predominantly
covalent

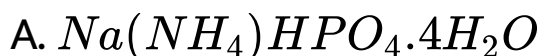
- C. show decreased chemical reactivity with dry oxygen in going from Li to Cs
- D. show increasing electronegativity from Li to Cs.

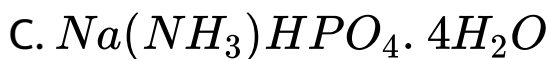
Answer: A



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73. Microcosmic salt is





Answer: A



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74. Lithium shows diagonal relationship with

A. Magnesium

B. Beryllium

C. Aluminium

D. Boron.

Answer: A



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75. Which of the following reacts with water at a high rate ?

A. Li

B. K

C. Na

D. Rb.

Answer: D



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76. With the increase in atomic weights, melting points of the alkali metals

A. increase

B. decrease

C. remain constant

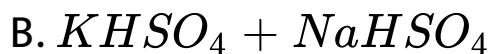
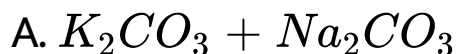
D. do not show definite trend.

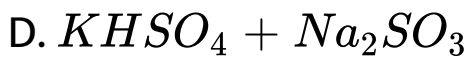
Answer: B



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77. The fusion mixture is a mixture of





Answer: A



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78. Sodium is made by the electrolysis of a molten mixture of about 40 % NaCl and 60 % $CaCl_2$ because

A. $CaCl_2$ helps in conduction of electricity

B. This mixture has a lower melting point than NaCl.

C. Ca^{+} + can displace Na from NaCl

D. Ca^{+} + can reduce NaCl to Na.

Answer: B



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79. Main process for the manufacture of Na_3CO_3 is

A. Castner process

B. Solvay process

C. Down process

D. Nelson process.

Answer: B



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80. When $NaOH$ is made, the gas released at the cathode is

A. Cl_2

B. H_2

C. O_2

D. H_2O .

Answer: B



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81. The valence shell electronic configuration of alkali metals is

A. ns^2ns^1

B. ns^1

C. $(n - 1)p^6 6ns^2$

D. $(n - 1)d^2 ns^2$

Answer: B



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82. The strongest reducing agent out of Na, K, Rb and Cs is

A. Na

B. Cs

C. Rb

D. K.

Answer: C



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83. Which of the following is a man made element ?

A. Ra

B. Fr

C. Rn

D. Lr.

Answer: B



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84. Which one of the these is basic ?

A. CO_2

B. SiO_2

C. Na_2O

D. SO_2

Answer: C



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85. Which one of these is most reactive ?

A. Na

B. K

C. Pb

D. Mg.

Answer: B



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86. Alkali metals are generally extracted by

- A. Reduction methods
- B. Double decomposition methods
- C. Displacement methods
- D. Electricity methods.

Answer: D



87. Which of the following statements is incorrect ?

A. Sodium is the not most abundant metal in earth's crust

B. Sodium is the most abundant metallic element in sea water.

C. melting and boiling points of alkali metals decrease down the group

D. Ionic character of alkali metal halides decreases down the group.

Answer: D



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88. Which one of the elements reacts directly with nitrogen to form nitride ?

A. Li

B. Ba

C. K

D. Rb.

Answer: A



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89. Identify the correct statement

A. Elemental sodium can be prepared and isolated by electrolysis of an aqueous solution of NaCl.

B. Elemental Na is a strong oxidising agent

C. Elemental Na is insoluble in NH_3

D. Elemental Na is easily oxidised.

Answer: D



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90. Which one of the following has highest electropositive character ?

A. Cu

B. Cs

C. Ba

D. Cr.

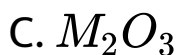
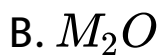
Answer: B



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91. The electronic configuration of metal M is $1s^2 2s^2 2p^6 3s^1$. The formula of its oxide will be :

A. MO



Answer: B



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92. Certain characteristics lithium differ from those of other alkali metals, the main reason for this is

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

B. Extremely high electropositivity of Li

C. Greater hardness of Li

D. Hydration of Li^+ ion.

Answer: A



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

A. $LiCl > KCl > NaCl > CsCl$

B. $\text{CsCl} > \text{KCl} > \text{NaCl} > \text{LiCl}$

C. $\text{NaCl} > \text{KCl} > \text{LiCl} > \text{CsCl}$

D. $\text{KCl} > \text{CsCl} > \text{NaCl} > \text{LiCl}$.

Answer: D



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

A. NaCl

B. NaF

C. NaBr

D. NaI.

Answer: B



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95. When CO is passed over solid NaOH heated to $200^{\circ}C$, it forms

A. Na_2CO_3

B. H_2CO_3

C. $HCOONa$

D. All.

Answer: C



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96. When a substance a reacts with water, it produces a combustible gas B and a solution of substance C in water. When another substances D reacts with this solution of C . It also produce

gas B on reaction with dilute sulphuric acid at room temperature . A imparts a deep golden yellow colour to the smokless flame of bunsen flame A,B , C and D are respectively

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 Fe.

Answer: A



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97. The metal extracted by electrolysis of its fused salt is

A. Iron

B. Sodium

C. Copper

D. Lead.

Answer: B



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98. Which of the following has the highest conductivity ?



Answer: B



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

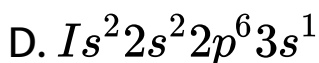
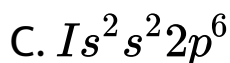
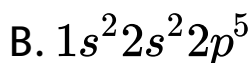
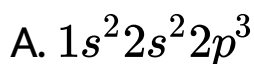
- A. High energy
- B. Low energy
- C. Longer wavelength
- D. None of these.

Answer: A



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100. Which of the following electronic configuration corresponds to an element with the lowest ionization energy ?



Answer: D



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

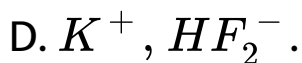
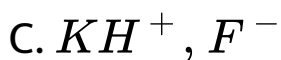
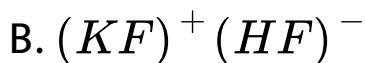
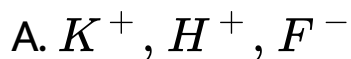
- A. Sodium hydride
- B. Sodium amide
- C. Sodium atoms
- D. Solvated electrons.

Answer: D



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102. Anhydrous mixture of KF and HF contains which type of ions ?



Answer: D



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103. On heating sodium metal in a current of ammonia the compound formed is

- A. Sodium amide
- B. Sodium azide
- C. Sodium nitride
- D. Sodium hydride.

Answer: A



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104. Which of the following alkali metal ions has the lowest ionic mobility in aqueous solutions?



Answer: C



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105. In $NaCl$, the chloride ions occupy the space in a fashion of

- A. fcc
- B. bcc
- C. Both
- D. None.

Answer: A



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106. Lithium is strongest reducing agent among alkali metals due to which of the following factor ?

A. Ionization energy

B. Electron affinity

C. Hydration energy

D. Lattice energy.

Answer: C



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107. The alkali metal that reacts with nitrogen directly to form nitride is

- A. Li
- B. Na
- C. K
- D. Rb.

Answer: A



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108. Excess of Na^+ ions in our system causes

- A. Diabetes
- B. Anaemia
- C. Low blood pressure
- D. High blood pressure.

Answer: D



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109. The correct arrangement of increasing order of atomic radius among Na, K, Mg, Rb is

A. $\text{Na} > \text{K} > \text{Mg} > \text{Rb}$

B. $\text{K} > \text{Na} > \text{Mg} > \text{Rb}$

C. $\text{Na} > \text{Mg} > \text{K} > \text{Rb}$

D. $\text{Mg} > \text{Na} > \text{K} > \text{Rb}$.

Answer: D



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110. The metal that dissolves in liquid ammonia, giving a dark blue coloured solution is

A. Tin

B. Lead

C. Sodium

D. Silver

Answer: C



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111. The number of electrons in $[K^{40}]^{-1}$ are

A. 18

B. 19

C. 20

D. 40

Answer: C



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112. Oxone is

A. CaO

B. N_2O

C. Na_2O_2

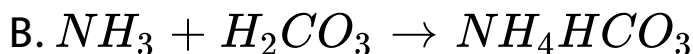
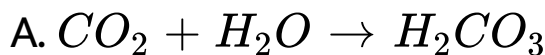
D. NaBO_3 .

Answer: C

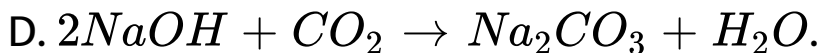
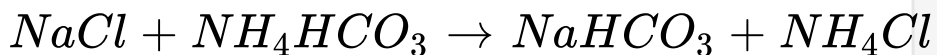


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113. Which one of the following reactions is not associated with the Solvay process of manufacture of sodium carbonate ?



C.

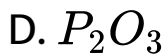
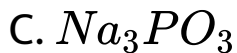
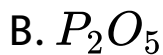
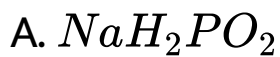


Answer: D



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114. Aqueous sodium hydroxide reacts with white phosphorus to form phosphine and



Answer: A



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115. Crystalline sodium chloride is a bad conductor of electricity because

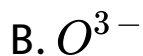
- A. It contains only molecules
- B. It does not posses ions
- C. The ions present in it not free to move
- D. It contains free molecules.

Answer: C



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116. Solution of K_2O in water in basic, because it contains a significant concentration of

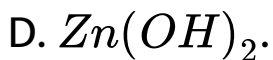
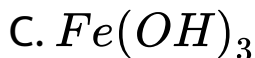
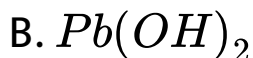
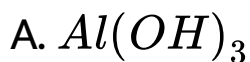


Answer: C



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



Answer: C



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118. In organic reactions, sodium in liquid ammonia is used as.....

- A. Reduction agent
- B. Hydrolysing agent
- C. Oxidising agent
- D. Precipitating agent.

Answer: A



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

- A. Weak oxidising agents
- B. Strong reducing agents
- C. Strong oxidising agents
- D. Weak reducing agents.

Answer: B



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120. Which of the following has lowest melting point ?

A. Li

B. Na

C. K

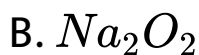
D. Cs.

Answer: D



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121. When sodium is treated with sufficient oxygen/air, the product obtained is



Answer: B



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122. Which of the following has the least ionization potential ?

A. Li

B. He

C. N

D. Zn.

Answer: A



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123. Smallest among these species is

A. Hydrogen

B. Helium

C. Lithium

D. Lithion ion.

Answer: A



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124. In electrolysis of $NaCl$ when Pt electrode is taken H_2 is liberated at cathode while Hg cathode it forms sodium amalgam because

A. Hg is more inert than Pt

- B. More voltage is required to reduce H^+ at Hg than at Pt
- C. Na is dissolved in Hg while it does not dissolve in Pt
- D. Concentration of H^+ ions is larger when Pt electrode is taken.

Answer: B



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125. An aqueous solution of sodium carbonate is alkaline because sodium carbonate is a salt of

- A. Weak acid and weak base
- B. Strong acid and weak base
- C. Weak acid and strong base
- D. Strong acid and strong base.

Answer: C



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126. In the Solvay process of manufacture of Na_2CO_3 , the byproducts are

A. NH_4Cl , CaO

B. CaO , Na_2CO_3

C. $CaCl_2$, CO_2 , NH_3

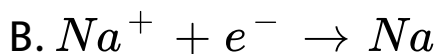
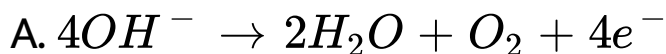
D. Na_2CO_3 , CO_2 .

Answer: C



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127. What is the reaction occurring at the anode in Down's process for the extraction of sodium ?

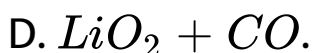
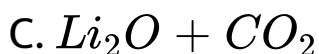
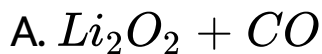


Answer: C



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128. What are the products formed when Li_2CO_3 undergoes decomposition?



Answer: C



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129. Aqueous NaCl solution is electrolyzed using platinum electrodes. What is the product formed at cathode?

A. Na

B. H_2

C. O_2

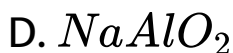
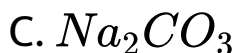
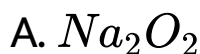
D. Cl_2

Answer: B



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130. 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



Answer: C



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

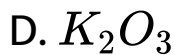
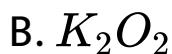
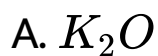
- A. Blue coloured solution is obtained
- B. Na^+ ions are formed in the solution
- C. Liquid ammonia becomes good conductor of electricity
- D. Liquid ammonia remains diamagnetic.

Answer: D



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132. Super oxide of potassium is



Answer: C



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133. Which of the following is monovalent ?

A. Alkali metals

B. Alkaline earth metals

C. Metalloids

D. Metals.

Answer: A



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134. How does the ionisation energy of 1st group elements vary ?

- A. increases down the group
- B. decreases down the group
- C. remain unchanged
- D. variation is not regular.

Answer: B



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135. Photoelectric effect is the maximum in

A. Cs

B. Na

C. K

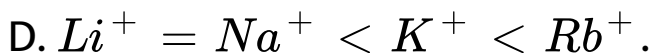
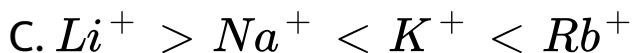
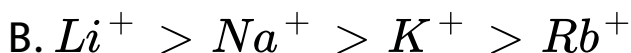
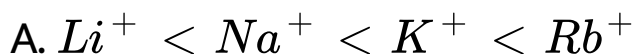
D. Li.

Answer: A



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136. The ionic conductance of the following cations in a given concentration is in the order



Answer: A



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137. NaOH is prepared by the method

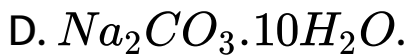
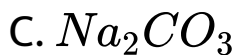
- A. Down's cell
- B. Castner cell
- C. Solvay process
- D. Castner Kellner cell.

Answer: D



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138. Baking soda is



Answer: A



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139. When washing soda is heated.

A. CO is released

B. $CO + CO_2$ is released

C. CO_2 is released

D. Water vapour is released.

Answer: D



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140. Which of the following is correct ?

A. In the Castner process of sodium extraction, $NaCl$ is used as an electrolyte

B. Sodium reduces CO_2 to carbon

C. Magnesium reacts with cold water and liberates hydrogen

D. Magnallium is one alloy of Mg and zinc.

Answer: B



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141. Sodium is heated in air at $300^\circ C$ to form X. X absorbs CO_2 and forms Na_2CO_3 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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142. Which of the following is not correct

A. SiO_2 is used as acid flux

B. The distance between the layers in graphite is 3.55×10^{-8} cm

C. SiO_2 reacts with Na_2CO_3 and liberates CO

D. The hybridization of C in graphite is sp^2 .

Answer: C



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143. Which of the following is not correct ?

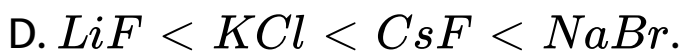
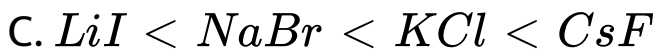
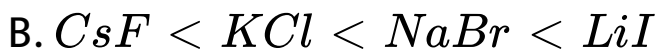
- A. Iodine oxidises sodium thiosulphate to sodium tetrathionate
- B. Sodium thiosulphate is soluble in water
- C. Ozone is used to identify the presence of unsaturation in alkene
- D. Sodium thiosulphate reacts with iodine to form sodium sulphate.

Answer: D



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144. The increasing order of ionic character of CsF, LiI, NaBr and KCl is



Answer: C



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145. Brine solution on electrolysis will not give

A. NaOH

B. Cl_2

C. H_2

D. O_2 .

Answer: D



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146. Consider the following abbreviations for hydrated alkali ion

$$x = |Li(H_2O)_n|^+, y = |K(H_2O)_n|^+$$

$$z = |Cs(H_2O)_n|^+$$

which is the correct order of size of these hydrated alkali ions

A. $x > y > z$

B. $z > y > x$

C. $x = y = z$

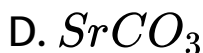
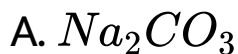
D. $z > x > y$.

Answer: A



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147. The carbonate that will not decompose on heating is

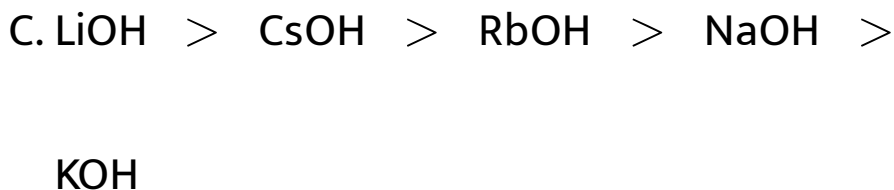
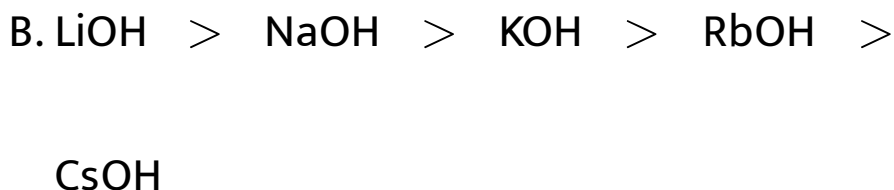
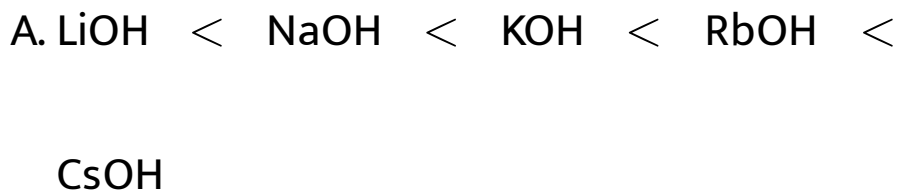


Answer: A



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148. The solubility of alkali metal hydroxides follows the order:



D. None of these.

Answer: A



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149. Potassium superoxide finds use in breathing equipment and safeguards the use to breathe in oxygen generated internally in the apparatus without being exposed to toxic fumes outside.

The supply of oxygen is due to

- (i) show decomposition of KO_2
- (ii) reaction of superoxide with moisture in the exhaled air
- (iii) reaction of KO_2 with CO_2 in the exhaled air.

A. (i), (ii) and (iii) are correct

B. (ii) and (iii) are correct

C. (i) and (ii) are correct

D. (iii) is only correct

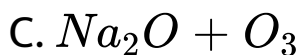
Answer: D



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

A. H_2O_2



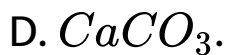
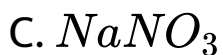
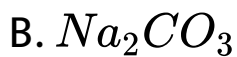
Answer: D



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





Answer: D



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152. PbO_2 is

A. peroxide and paramagnetic

B. peroxide and diamagnetic

C. superoxide and paramagnetic

D. superoxide and diamagnetic.

Answer: C



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153. For alkali metals, which one of the following trends is incorrect ?

A. Hydration energy : $\text{Li} > \text{Na} > \text{K} > \text{rb}$

B. Ionization energy : $\text{Li} > \text{Na} > \text{K} > \text{Rb}$

C. Density : $\text{Li} > \text{Na} > \text{K} > \text{Rb}$

D. Atomic size : $\text{Li} < \text{Na} < \text{K} < \text{Rb}$.

Answer: C



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154. Which of the following sets will have highest hydration energy and highest ionic radii

A. Na and Li

B. Li and Rb

C. K and Na

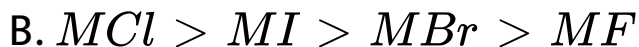
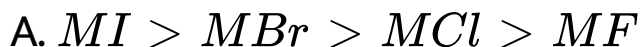
D. Cs and Na.

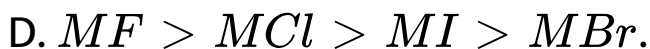
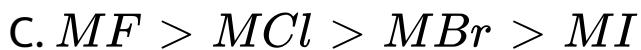
Answer: B



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155. In the case of alkali metals, the covalent character decreases in the order.





Answer: A



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156. Which of the following compound is most stable ?



C. LiBr

D. LiI.

Answer: A

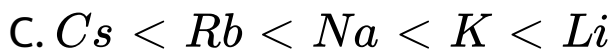


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157. The increasing order of the density of the alkali metal is

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

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

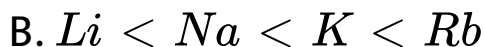
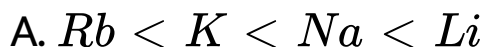


Answer: A



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158. The correct order of reducing character of alkali metals is



C. $Na < K < Rb < Li$

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

Answer: C



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159. In organic reaction, metallic sodium in liquid ammonia behaves as

A. oxidising agent

B. reducing agent

C. bleaching agent

D. dehydrating agent.

Answer: B



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160. The alkali halide which is soluble in pyridine is

A. NaCl

B. LiCl

C. KCl

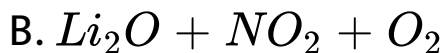
D. CsCl

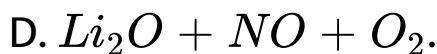
Answer: B



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161. The products obtained on heating $LiNO_3$ will be



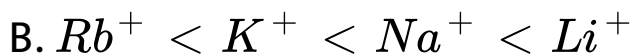
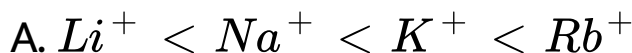


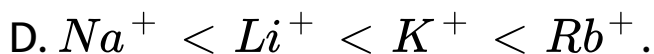
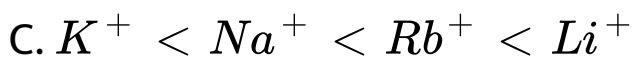
Answer: B



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





Answer: A



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163. Which of the following alkali metals form only, the normal oxide, M_2O on heating in air ?
(where M is the alkali metal)

A. Rb

B. K

C. Li

D. Na.

Answer: C



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

A. Lowering the temperature

B. adding a little alcohol

C. amalgamating sodium

D. adding a little acetic acid.

Answer: C



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165. Among the following compounds, the one that gets hydrolysed to form metallic hydroxide, hydrogen peroxide and oxygen is

A. Na_2O

B. Na_2O_2

C. Li_2O

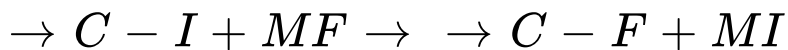
D. KO_2 .

Answer: D



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166. In the replacement reaction



The reaction will be most favourable if M happens to be

A. Na

B. K

C. Rb

D. Li.

Answer: C



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167. Alkali metals have negative reduction potential and hence they behave as

A. oxidising agents

B. Lewis base

C. reducing agents

D. electrolytes.

Answer: C



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168. Which of the following statements is false regarding alkali metals

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 metal are highly electropositive

D. Alkali metal hydrides are covalent in character.

Answer: A



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169. In solvay process of manufacture of sodium carbonate, the by product is

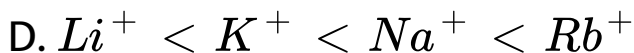
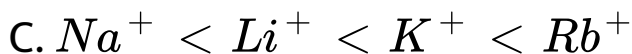
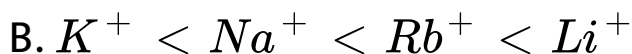
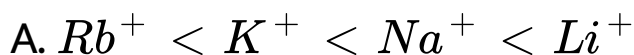


Answer: C



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



Answer: C



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

A. K

B. Li

C. Na

D. Rb.

Answer: C



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172. Alkali metals have negative reduction potential and hence they behave as

A. Oxidising agents

B. Lewis base

C. reducing agents

D. electrolytes.

Answer: C



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Reason Assertion

1. Assertion (A) Li is the weakest reducing agent among the alkali metals

Reason (A) In alkali metals, ionisation energy decreases down the group.



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2. Assertion (A) The reaction $\text{LiI} + \text{KF} \rightarrow \text{LiF} + \text{KI}$ proceed in the direction indicated.

Reasons (A) Fluorine, being more reactive can easily replace iodine.



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3. Assertion (A) Following reaction proceed better with KF than with NaF.



Reason (A) K is more reactive than Na.



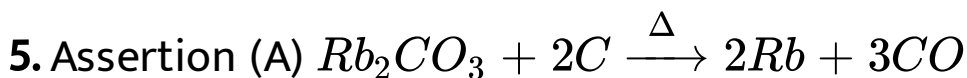
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Reasons (A) Na is more reactive than K



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Reason (A) Rubidium cannot be produced by reduction with carbon.



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6. Assertion (A) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^1$ is the configuration of an alkali metal.

Reason (A) Alkali metal contain one electron in the s-subshell of valence shell.



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7. Assertion (A) LiF is the least soluble of all the lithium halides in water.

Reasons (A) It is due to its very high lattice energy.



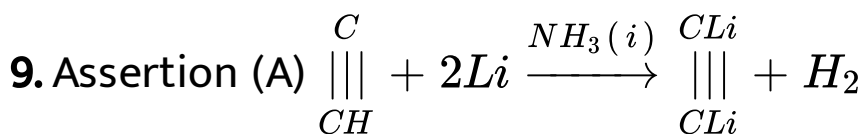
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8. Assertion (A) CsI is least soluble of all the caesium halides in water.

Reasons (A) It is due to low hydration energy.



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Reasons (A) Alkali metals form acetylides with terminal alkynes.



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10. Assertion (A) In the electrolysis of aqueous NaCl, Na is preferentially discharged at the mercury cathode forming sodium amalgam.

Reasons (A) It is due to the fact that hydrogen has a high over voltage at mercury cathode.



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

Reason (R): The alkali metals have low EN. Their

hydrides conduct electricity, when fused and liberate hydrogen at the anode.



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12. Assertion (A): Sodium ions are discharged in preference to hydrogen ions at a mercury cathode.

Reason (R): The nature of cathode can affect the order of discharge of cations.



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13. Assertion (A) Li resembles Mg.

Li^+ has same size as Mg^{2+} .



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14. Assertion (A): Alkali metals impart colour to the flame.

Reason (R): The ionisation energies are low.



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15. Statement I $LiCl$ is predominantly a covalent compound.

Statement II Electronegativity difference between Li and Cl is too small



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Itq

1. Number of alkali metals which form complex hydrides K, Cs, Rb, Li, Na, Fr.



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2. Number of alkali metals which form complex hydrides K, Cs, Rb, Li, Na, Fr.



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3. How many of the following alkali metals are kept on kerosene oil Li, Na, K, Rb, Cs.



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4. The number of alkali metals which is (are) radioactive.



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Ultimate Preparatory Package

1. Which among the following is most soluble in alcohol ?



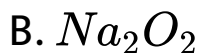


Answer: B



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2. Which of the following is used as a source of O_2 in space capsules, submarines etc?



C. Li_2O

D. Na_2O .

Answer: B



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3. Li_2O_2 is formed when

A. Li is heated strongly in excess of air

B. LiOH is heated in an atmosphere of O_2

C. H_2O_2 and alcohol are added to a solution
of LiOH in water

D. None of these.

Answer: C



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4. Most insoluble salt of Li in water is

A. Li_2CO_3

B. Li_2SO_4

C. Li_3PO_4

D. LiF.

Answer: C



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5. The order of solubility of lithium halides in non-polar solvents follows the order

A. $LiI > LiBr > LiCl > LiF$

B. $LiBr > LiCl > LiF > LiI$

C. $\text{LiF} > \text{LiI} > \text{LiBr} > \text{LiCl}$

D. $\text{LiCl} > \text{LiF} > \text{LiI} > \text{LiBr}$.

Answer: A



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6. Melting points of chlorides of alkali metals follow the order

A. $\text{LiCl} > \text{CsCl} > \text{RbCl} > \text{NaCl} > \text{KCl}$

B. $\text{KCl} > \text{RbCl} > \text{CsCl} > \text{LiCl} > \text{NaCl}$

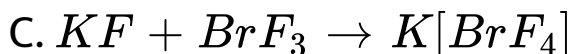
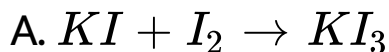


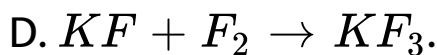
Answer: D



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7. Which of the following is not correct ?



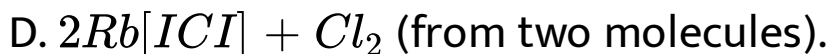
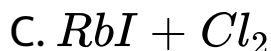
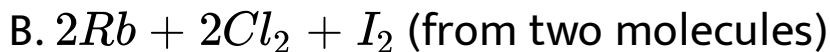
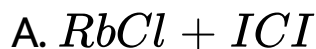


Answer: D



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8. $Rb[ICl_2]$ on heating gives

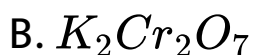


Answer: A



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9. Which of the following is white ?



D. None of these.

Answer: D

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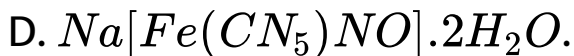
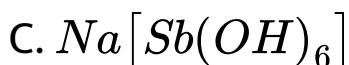
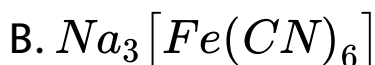
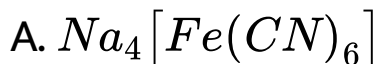
10. Which of the following is not a white crystalline solid ?



Answer: A

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11. The most insoluble salt of sodium is



Answer: C



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12. A colloidal solution of Na in ether is

A. golden yellow in colour

B. blue in colour

C. colourless

D. violet in colour.

Answer: D



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13. Pick the odd one out

A. $1s^2 2s^1$

B. $1s^2 2s^2 2p^6 3s^1$

C. $1s^2 2s^2 2p^6 3s^2 3s^6 3d^{10} 4s^1$

D. None.

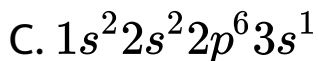
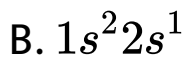
Answer: C



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14. Pick the odd one out

A. $1s^1$



D. None.

Answer: A



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15. The alkali metal which can be obtained by reduction of its carbonate with carbon is

A. Na

B. Li

C. Rb

D. None.

Answer: C



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16. The alkali metal which can be obtained by metal displacement is

A. Li

B. Na

C. K

D. None.

Answer: C



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17. A highly concentrated solution (about 5 M) of an alkali metal in ammonia (pick the odd one out)

A. is called expanded metal

B. is highly unstable

C. is diamagnetic in nature

D. is bronze like in colour.

Answer: B



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18. A moderately concentrated solution of an alkali metal in NH_3 (pick the odd one out)

A. is blue coloured

B. is paramagnetic

C. is a good conductor of electricity and its conductivity increases with increase in temperature

D. is meta stable.

Answer: C



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19. Pick the odd one out

A. Li_3PO_4 is the most insoluble salt of Li

B. LiI is the least stable alkali metal halide

C. Solubility of Li_2SO_4 decreases with increase in temperature

D. Li is the weakest reducing agent among alkali metals.

Answer: D



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