



CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

THE BORON FAMILY

Multiple Choice Questions

1. Which of the following configurations is characteristic of group 13 elements?

A. ns^2np^1

B. $(n - 1)d^{10}ns^2np^2$

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

D. $[Ar]3d^{10}4s^24p^1$

Answer: A

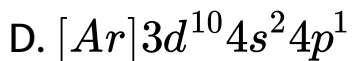
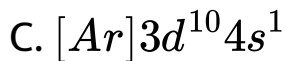


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2. The electronic configuration of Gallium is

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

B. $[Ar]3d^94s^1$



Answer: D



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3. Which one of the following elements has the highest melting point?

A. Boron

B. Aluminium

C. Gallium

D. Thallium

Answer: A



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4. The electropositive first increases from B to Al and then decreases from Al to Tl own the group because of

- A. decrease in ionization energy of the elements
- B. increase in size of the elements

C. ineffective shielding of nuclear charge by d-electrons in case of Ga, In and Tl due to which the valence electrons are tightly held and are not lost easily.

D. decrease in electronegativity of the elements.

Answer: C



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5. The element which shows least metallic character is

A. Indium

B. Boron

C. Aluminium

D. Gallium

Answer: B



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6. Generally the atomic and ionic radii increase with increase in atomic number down the group. But the atomic size of aluminium and gallium is almost the same. This is because

- A. the high nuclear charge of Ga and Tl
- B. the intervening d and f electrons
- C. high ionization energies of these elements
- D. none of these

Answer: B



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7. The ionization energies of B and Al as compared to Be and Mg are

- A. lower

B. higher

C. equal

D. none of these

Answer: A



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8. The first ionisation potential of Al is smaller than that of Mg because :

A. atomic size of $Al > Mg$

B. atomic size of $Al < Mg$

C. Al has electron in the p – orbital

D. atomic number of $Al > Mg$

Answer: C



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9. Which member of group 13 does not exhibit the group valency in its compounds?

A. Boron

B. Aluminium

C. Gallium

D. Thallium

Answer: D



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10. Group 13 elements exhibit

A. Only +1 oxidation state

B. Only +3 oxidation state

C. Both +1 and +3 oxidation state

D. +1, +2 and +3 oxidation state

Answer: C



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11. Both boron and aluminium show difference in properties from the remaining members of group 13. This because

A. both B and Al have smaller size as compared to other members of the family

B. both B and Al have high values of ionization energy

- C. both B and Al have 2 and 8 electrons in their last but one shell respectively but the electrons in their last but one shell
- D. none of these

Answer: C



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12. Which of the following statements is incorrect?

- A. Al compounds are ionic
- B. Al is a light metal or great tensile strength

C. Al is a powerful reducing agent

D. Al does not react with steam even at higher temperature.

Answer: A



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13. The three stes of elements are given below

(i) Boron, aluminium, gallium, beryllium

(ii) Boron, aluminium, gallium, germanium

(iii) Boron, aluminium, thallium, rubidium

Which of the above contains groups of elements

whose properties are similar in many respect to group 13 elements?

A. (ii)

B. (iii)

C. (i)

D. (i) and (iii)

Answer: C



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14. The $I. E_1$ among the group 13 member follows as

A. $B > Al < Ga < Tl$

B. $B > Al > Ga > Tl$

C. $B > Ga > Al > Tl$

D. $B > Ga < Al < Tl$

Answer: C



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15. The melting point of Group 13 follows the order

A. $B > Al > Ga > In > Tl$

B. $B > Al < Ga > In > Tl$

C. $B > Al > Tl > In > Ga$

D. $B > Al < Ga < In < Tl$

Answer: C



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16. Which of the following statements is not true for Al and B ?

- A. They burn in oxygen to give oxides at higher temperature
- B. Their halides are Lewis acids
- C. They combine with nitrogens to form nitrides
- D. They react with HCl to give chloride.

Answer: D



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17. Which of the following statements is false ?

- A. Boron trifluoride is a strong Lewis base
- B. Aluminium is a good reducing agent
- C. Boron resembles silicon in many respects
- D. Boron does not form B^{3+} .

Answer: A



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18. Which of the metal chlorides has maximum covalent character ?

A. NaCl

B. AlCl_3

C. CsCl

D. BaCl_2

Answer: B



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19. Among the halides of the elements of group 13 the one which is most acidic is

A. BF_3



Answer: D



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20. Monovalency of heavier members of group 13 elements can be explained on the basis of

A. their low ionisation energies

B. their low electronegativity values

C. their larger sizes

D. inert pair effect

Answer: D



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21. Inert pair effect is observed

A. When an element shows inertness in
chemical combination

B. When a bond pair of electrons is present in
the element

C. When the the ns electrons remain paired and
do not participate in bonding

D. When non-metallic character decreases

Answer: C



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22. The highly toxic element of group 13 is

A. Al

B. B

C. Ga

D. Tl

Answer: D



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23. Which of the following is an electron deficient compound?

A. $MgCl_2$

B. BCl_3

C. $GeCl_3$

D. CCl_4

Answer: B



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24. Which of the following does not form M^{3+} ion?

A. Boron

B. Aluminium

C. Indium

D. Gallium

Answer: A



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25. Melting point is highest for

A. B

B. Al

C. Ga

D. In

Answer: A



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26. Boron does not form B^{3+} ions because

- A. boron has small size and high ionization energy
- B. boron has high electronegativity
- C. boron has high charge density
- D. None of these

Answer: A



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27. Boron has a very high melting point among the elements of group 13 because of

A. strong bonding between individual atoms in the solid state

B. small size of B

C. very high electronegativity of B

D. very high ionization energy of B

Answer: A



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28. Aluminium is

- A. a reducing agent
- B. an oxidising agent
- C. amphoteric
- D. highly electronegative agent

Answer: A



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29. Aluminium appears like gold when it is mixed with

A. 50 % *Co*

B. 50 % *Ni*

C. 90 % *Cu*

D. 90 % *Sn*

Answer: C



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30. Aluminium powder is used

A. in the extraction of gold

B. in calico-printing

C. in sizing paper

D. in flash bulbs

Answer: D



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31. Which one of the following metal cannot be extracted by using Al as a reducing agent ?

A. Na from Na_2O

B. Cr from Cr_2O_3

C. Mn from Mn_3O_4

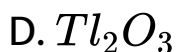
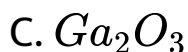
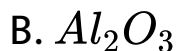
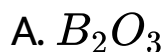
D. W from WO_3

Answer: A



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32. Which of the following oxides is strongly basic?

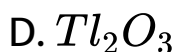
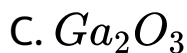
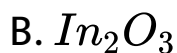
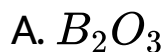


Answer: D



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33. The amphoteric oxide from among the following is



Answer: D



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34. B_2O_3 is

A. Acidic

B. Basic

C. Amphoteric

D. None of these

Answer: A



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35. Aluminium is more reactive than iron. But aluminium is less easily corroded than iron because.

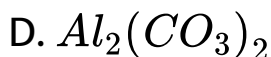
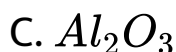
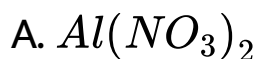
- A. aluminium is a noble metal
- B. iron undergoes reaction easily with water
- C. oxygen forms a protective oxide layer
- D. iron forms mono and divalent ions

Answer: C



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36. Although Al has a high oxidation potential it resists corrosion because of the formation of a tough, protective coat of

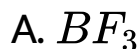


Answer: C



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37. Which out of the following compound does not exist?



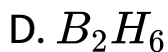
D. Both (B) and (C)

Answer: C



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38. Which of the following is not possible ?



Answer: C



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39. Which of the following statements is wrong about BCl_3 ?



B. BCl_3 acts as a Lewis acid

C. BCl_3 does not form a dimer

D. In BCl_3 , the $B - Cl$ bonds are greater than single bonds.

Answer: D



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40. BCl_3 does not exist as dimer but BH_3 exist as dimer (B_2H_6) because :-

A. chlorine is more electronegative than hydrogen

B. there is $p\pi - p\pi$ back bonding in BCl_3 but

BH_3 does not contain such multiple bonding

C. large sized chlorine atoms do not fit in

between the small boron atoms whereas

small sized hydrogen atoms get fitted in

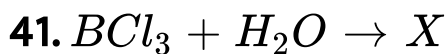
between

D. none of the above

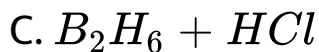
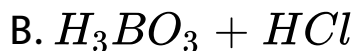
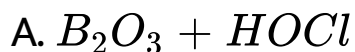
Answer: C



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The products formed in the above reaction are



D. No reaction

Answer: B



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42. The power of halides of boron to act as Lewis acids decreases in the order



Answer: B



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43. Pick up the wrong statement

A. Anhydrous $AlCl_3$ exists as Al_2Cl_6 (dimer)

B. Anhydrous $AlCl_3$ is a trigonal planar molecule

C. Anhydrous $AlCl_3$ fumes in air

D. Anhydrous $AlCl_3$ is ionic.

Answer: D



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44. Which of the following statements about aluminium chloride is incorrect?

- A. It exists as a dimer
- B. It is a covalent compound
- C. It involves back bonding between Cl and Al
- D. Its aqueous solution conducts electricity

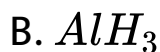
Answer: C



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45. The product of reaction between LiH and $AlCl_3$ gives

- A. Li



Answer: D



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46. Aluminium chloride acts as a strong Lewis acid because



C. $AlCl_3$ is an electron deficient compound

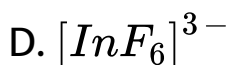
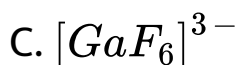
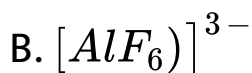
D. $AlCl_3$ is easily hydrolysed

Answer: C



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47. Which specie does not exist?



Answer: A



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48. Amongst the halides

1. BCl_3 , 2. $AlCl_3$

3. $GaCl_3$, 4. $InCl_3$

The order of decreasing Lewis acid character is

A. 1,2,3,4

B. 4,3,2,1

C. 3,4,2,1

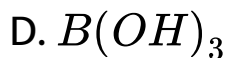
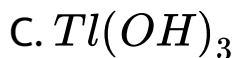
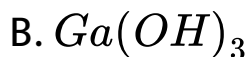
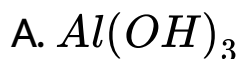
D. 2,3,4,1

Answer: B



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49. Which of the following hydroxide is acidic?



Answer: D



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50. $B(OH)_3$ is

A. Basic

B. Monobasic

C. Dibasic

D. Tribasic

Answer: B



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51. $Al(OH)_3$ is

A. acidic

B. Basic

C. amphoteric

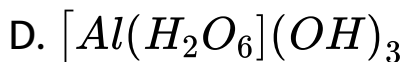
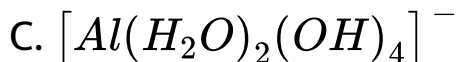
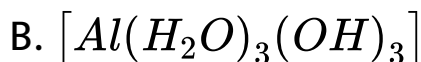
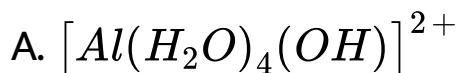
D. neither acidic nor basic

Answer: C



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52. The dissolution of $Al(OH)_3$ by a solution of $NaOH$ results in the formation of



Answer: C



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53. Aqueous ammonia is used as a precipitating reagent for Al^{3+} ions as $Al(OH)_3$ rather than aqueous NaOH, because

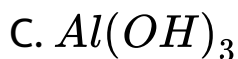
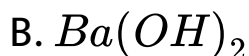
- A. NH_4^+ is a weak base
- B. $NaOH$ is a very strong base
- C. NaOH form $[Al(OH)_4]^-$ ions
- D. NaOH forms $[Al(OH)_2]^+$ ions

Answer: C



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54. A lake can be obtained by making a mixture of a coloured dye with



Answer: C



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55. Which of the following does not react with aqueous NaOH ?

A. B

B. Al

C. Ga

D. Tl

Answer: A



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56. Which of the following does not react with water?

A. Boron

B. Aluminium

C. Sodium

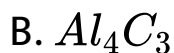
D. Thallium

Answer: A



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57. Which out of the following compounds will liberate methane upon reaction with water?



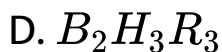
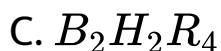
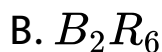
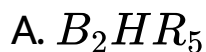
D. Both (B) and (C)

Answer: D



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58. Diborane undergo alkylation reaction with Br_3 forming



Answer: C



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59. Which of the following is false about B_2H_6 ?

- A. it contains two types of H atoms
- B. it contains B-B covalent bond
- C. Rotation of B-B axis is not possible
- D. The Two boron atoms along with four H atoms lie in one plane

Answer: B



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60. The compounds of boron and hydrogen are collectively called

A. Diboranes

B. Borazoles

C. Boracits

D. Boranes

Answer: D



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61. Diborane upon hydrolysis gives

A. Boric anhydride

B. Metaboric acid

C. Orthoboric acid

D. Boron oxide

Answer: C



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62. In B_2H_6

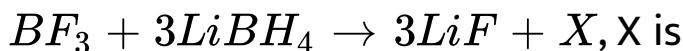
- A. there is a direct boron-boron bond
- B. the boron atoms are linked through hydrogen bridge
- C. the structure is similar to C_2H_6
- D. all the atoms are in one plane

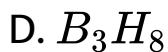
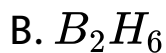
Answer: B



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63. In reaction





Answer: B



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64. Which of the following statements is false?



B. Boron hydrides can't be used as high energy fuels

C. Boron hydrides are readily hydrolysed

D. All the boron hydrides are prepared by the action of dil. HCl on Mg_3B_2

Answer: B



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65. The bonds present in Borazole or Inorganic benzene are

A. $9\sigma, 6\pi$

B. $12\sigma, 3\pi$

C. $6\sigma, 9\pi$

D. 15σ only

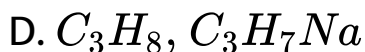
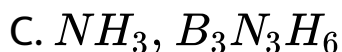
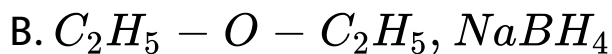
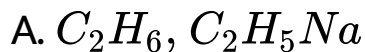
Answer: B



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66. An alkali metal hydride (NaH) reacts with diborane in Y to give a tetrahedral compound Z, which is extensively used as reducing agent in

organic synthesis. The Y and Z in the above reaction are

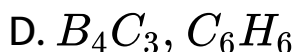
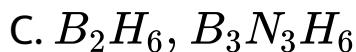
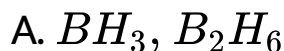


Answer: B



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67. A compound of boron X reacts at $200^{\circ}C$ temperature with NH_3 to give another compound Y which is called as inorganic benzene. The compound Y is a colourless liquid and is highly light sensitive. Its melting point is $-57^{\circ}C$. The compound X with excess of NH_3 and at a still higher temperature gives boron nitride $(BN)_n$. The compounds X and Y are respectively :

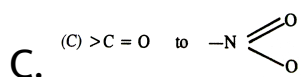


Answer: C



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68. $NaBH_4$ is used in organic chemistry to convert

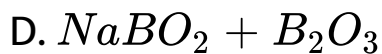
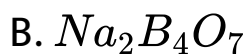
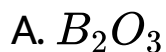


Answer: B



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69. When borax is heated strongly it gives



Answer: D



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70. In Borax bead test the coloured ions give characteristic coloured beads due to formation of

- A. metal borates
- B. metal metaborates
- C. metal phosphates
- D. metal tetraborates

Answer: B



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71. Which of the following is not correct in case of Boron nitride?

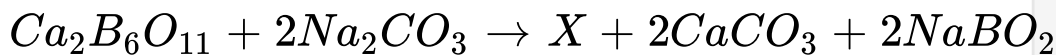
- A. It is also called borazone
- B. It has magnetic properties
- C. It is hard because it has diamond like structure
- D. It is chemically unreactive

Answer: B

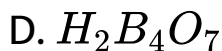
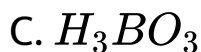
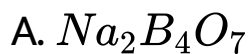


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72.



The compound X in the above reaction is

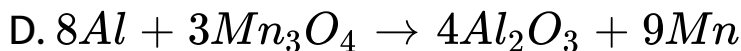
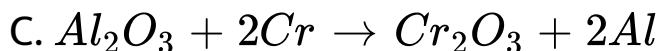
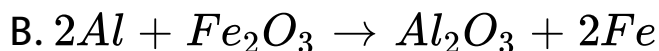
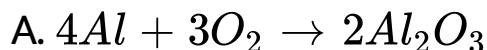


Answer: A



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73. Which out of the following reactions does not take place ?

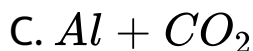
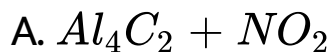


Answer: C



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74. When Al_2O_3 is heated with C in an atmosphere of N_2 at high temperature, the product formed is

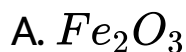


Answer: B



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75. Hydrogen gas can be produced by the reaction of Aluminium with a concentrated solution of



B. acetic acid

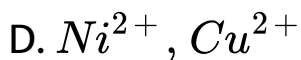
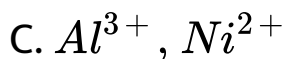
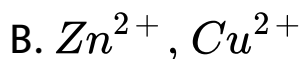
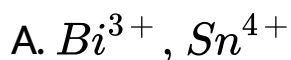


Answer: C



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76. Which are amongst the following pairs of ions cannot be separated by H_2S is dilute HCl ?

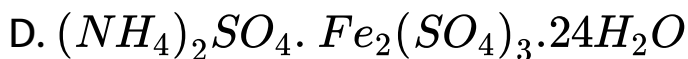
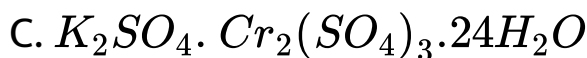
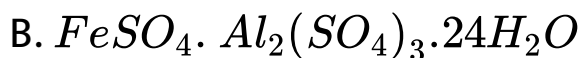
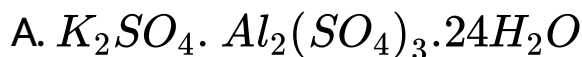


Answer: C



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77. Which of the following is not isomorphous with true alum and is called pseudoalum ?



Answer: B



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78. alums are used for :

- A. Tanning to leather
- B. Coagulating of blood
- C. Purification of water
- D. All the above

Answer: D



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79. The aluminium salt commonly used to stop bleeding is

- A. Aluminium sulphate
- B. Potash alum
- C. Aluminium chloride
- D. Aluminium fluoride

Answer: B



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80. The nature of the solution of Potash alum is

A. Basic

B. Acidic

C. Neutral

D. Amphoteric

Answer: B



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81. Lithium cannot form because of its

A. small size

B. high electropositivity

C. high Ionisation energy

D. small number of eelctrons

Answer: A



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82. Which of the following property does not support anomalous behaviour of boron?

A. Small size

- B. High electronegativity
- C. High ionization energy
- D. Formation of trihalides

Answer: D



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83. Boron and silicon resemble in all respect except

- A. both form acidic oxides
- B. their hydrides are stable

C. their chlorides hydrolyse to their respective acids

D. both form halides which are Lewis acids.

Answer: D



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84. Which of the following is used as control rods in nuclear reactors?

A. Al

B. Ga

C. TI

D. B

Answer: D



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85. Two elements X and Y react separately with highly electropositive metal to form binary compounds, which upon hydrolysis yield mixture of boranes and silanes. X and Y respectively are

A. B, Si

B. Si, B

C. Al, B

D. B, Al

Answer: A



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86. Which out of the following compounds of Boron is hardest ?

A. Boron oxide

B. Boron carbide

C. Boron nitride

D. Boron hydroxide

Answer: B



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87. Which one is not an ore of aluminium ?

A. China clay

B. Mica

C. Cryolite

D. Carnallite

Answer: D



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88. Bauxite containing chief impurities of oxides of silicon is called

- A. Red bauxite
- B. White bauxite
- C. Black bauxite
- D. No specific name

Answer: B



89. In the purification of bauxite by Hall's process

- A. Bauxite ore is heated with NaOH solution at $150^{\circ}C$
- B. Bauxite ore is fused with Na_2CO_3
- C. Bauxite ore is mixed with coke and heated at $1800^{\circ}C$ in a current of nitrogen
- D. Bauxite ore is heated with $NaHCO_3$

Answer: B



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90. Pure alumina is

- A. a good conductor of electricity
- B. a bad conductor of electricity
- C. volatile in nature
- D. an electrovalent compound

Answer: B



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91. In the electrolysis of alumina it is mixed with cryolite (Na_3AlF_6) and Fluorspar (CaF_2) in the ratio 20:40:20. The function of cryolite and fluorspar is

A. To dissolve alumina

B. To increase ionization of alumina

C. To increase the fusion temperature of alumina

D. To decrease the fusion temperature of alumina and to make it good conductor of electricity.

Answer: D



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92. Sapphire is a mineral of

A. Ba

B. B

C. Bi

D. Al

Answer: D



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93. When Al is added to hot solution of KOH ?

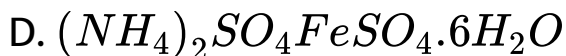
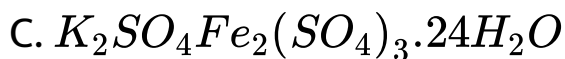
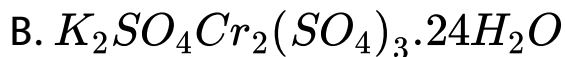
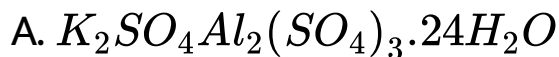
- A. No action takes place
- B. Oxygen is evolved
- C. Water is produced
- D. Hydrogen is evolved

Answer: D



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94. Common alum is



Answer: A



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95. Anhydrous aluminium chloride is prepared by

- A. Dissolving aluminium metal in conc. HCl
- B. By heating a mixture of alumina with chlorine
- C. By heating a mixture of alumina and carbon with dry chlorine
- D. By heating alumina with dry HCl

Answer: C



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96. Thermite is a mixture of

- A. Fe and Al

B. Ferric oxide and aluminium powder

C. Barium peroxide and magnesium powder

D. *Cu* and *Al*

Answer: B



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97. In the extraction of aluminium the purpose of addition of cryolite to alumina is :

A. to obtain more aluminium

B. to dissolve bauxite

C. to product anodes

D. to cause reduction

Answer: B



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98. Which of the following techniques is used in the manufacture of aluminium from bauxite

A. Reduction with magnesium

B. Reduction with coke.

C. Electrolytic reduction

D. Reduction with iron.

Answer: C



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99. The cathode used in the electrolytic cell during aluminium extraction is made of

A. Aluminium

B. Carbon lining

C. Iron

D. Steel

Answer: B



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100. Which of the statement about aluminium is not correct

A. It liberates hydrogen from acids as well as alkalis

B. It liberates hydrogen from acids but not from alkalis

C. It liberates hydrogen from hot alkali solution

D. It liberates hydrogen from boiling water.

Answer: B



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101. During Hoope's process for electrolytic refining of Al, the middle layer is of

A. Pure aluminium

B. Impure aluminium

C. Cryolite and BaF_2

D. Alloys to Al, Ca, Si

Answer: C



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102. Which is wrong?

A. Anhyd. $AlCl_3$ exists as Al_2Cl_6 (dimer)

B. Anhyd. $AlCl_3$ sublimes on heating

C. Anhyd. $AlCl_3$ fumes in air

D. Anhyd. $AlCl_3$ is ionic

Answer: D



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103. In silvery paints, the main constituent present is

A. Aluminium powder

B. Silver powder

C. Lead powder

D. White lead

Answer: A



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104. Aluminium salt commonly used to stop bleeding is

- A. Aluminium sulphate
- B. Potash alum
- C. Aluminium chloride
- D. Aluminium fluoride

Answer: B



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105. $AlCl_3$ is hygroscopic in nature. It means

- A. $AlCl_3$ undergoes air oxidation
- B. $AlCl_3$ is a strong oxidising agent
- C. $AlCl_3$ absorbs moisture and becomes liquid
- D. $AlCl_3$ absorbs moisture when exposed to air

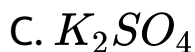
Answer: D



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106. The chief impurity present in bauxite is

- A. SiO_2
- B. Fe_2O_3



Answer: B



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107. In the electrolysis of alumina, a layer of powdered coke is spread on the surface of the electrolyte in the cell

A. to increase the electrical conductivity

B. to decrease the melting point of alumina

- C. to prevent the loss of heat by radiation and burning of carbon electrode
- D. None of the above

Answer: C



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108. The first step involved in the purification of white bauxite by Serpeck's method is

- A. Treatment of bauxite with concentrated solution of caustic soda under pressure at

423K

B. Fusion of powdered bauxite with sodium carbonate

C. Heating of powdered bauxite with coke in a current of nitrogen

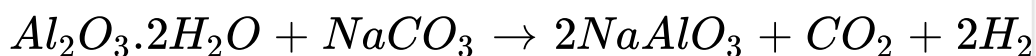
D. None of the above

Answer: C



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109. Name the method used for the purification of red bauxite where the following reaction is involved



A. Baeyer's method

B. Hall's method

C. Serpeck's method

D. Hoope's method

Answer: B



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110. Eka-aluminium is

- A. Gallium
- B. Germanium
- C. Indium
- D. Scandium

Answer: A



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111. An alumina-silica clay called bentonite is dropped from aeroplanes in the slurry form for

- A. Fertilizing the soil
- B. Cooling cover over fires
- C. Cooling th soil
- D. Fumigation

Answer: B



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112. Aluminium chloride exists as a dimer because aluminium has :

- A. It has better reflecting power than Ag
- B. It does not scratch
- C. Coating is much smoother
- D. It does not tarnish in air

Answer: D



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113. Of the following statements which is true?

(i) Baeyer's process is employed for purification of bauxite containing silica

(ii) All the $Al - Cl$ bonds in Al_2Cl_6 are equivalent

(iii) An aqueous solution of aluminium chloride is acidic

A. (i) and (ii)

B. (ii) and (iii)

C. (iii)

D. (i), (ii), (iii)

Answer: C



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114. When Al_2Cl_6 is dissolved in water then

- A. the dimeric structure remains as such
- B. it undergoes polymerisation
- C. the dimeric structure disappears
- D. it can't be dissolved since lattice energy exceeds the hydration energy.

Answer: C



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115. Aluminothermy used for on the spot welding of large iron structures is based upon the fact that

A. As compared to iron, aluminium has greater affinity for oxygen

B. As compared to aluminium iron has greater affinity for oxygen

C. Reaction between iron and oxygen is endothermic

D. Reaction between aluminium and oxygen is endothermic

Answer: A



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116. Which of the following statements about anhydrous Aluminium chloride is correct?

- A. It exists as $AlCl_3$ molecule
- B. It is a strong Lewis Base
- C. It is not readily hydrolysed
- D. It sublimes at $100^\circ C$ under vacuum

Answer: D



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117. Boric acid is polymeric due to

- A. its acidic nature
- B. the presence of hydrogen bonds
- C. its monobasic nature
- D. its geometry

Answer: B



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118. Which of the following statements regarding boric acid is false?

- A. It acts as a tribasic acid
- B. It has a planar structure
- C. It acts as a monobasic acid
- D. It is soluble in hot water

Answer: A



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119. Pick up the wrong statement

- A. Borax is used in the manufacture of optical glasses
- B. Borax is used as a flux
- C. Borax is used as a water softener
- D. Borax is not used for glazing paper

Answer: D



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120. Aluminium vessels should not be washed with materials containing washing soda because -

- A. washing soda is expensive
- B. washing soda is easily decomposed
- C. washing soda reacts with aluminium to form soluble aluminate
- D. washing soda reacts with aluminium to form insoluble aluminium oxide.

Answer: C



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121. Which of the following statements about inorganic naphthalene is false?

- A. Inorganic naphthalene is $B_5N_5H_8$
- B. It is prepared from inorganic benzene by passing silent electric discharge through it
- C. Its structure is analogous to naphthalene
- D. All the above statements are incorrect.

Answer: D



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122. In the electrolytic extraction of aluminium, the solvent is

A. water

B. $Fe_2O_3 + Al$

C. Molten cryolite

D. Molten Al_2O_3

Answer: C



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123. Precious Ruby stones are

A. Aluminium silicate

B. Alumina

C. Sodium aluminium silicate

D. Sodium silicate

Answer: B



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124. Which is used in high temperature thermometry ?

A. Sn

B. As

C. Hg

D. Ga

Answer: D



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125. Which metal in powdered form suspended in oil is used paint for mirrors?

A. Ag

B. Fe

C. Sn

D. Al

Answer: D



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126. A mineral acid used as disinfectant is

A. Phosphoric acid

B. Sulphuric acid

C. Phosphrous acid

D. Boric acid

Answer: D



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127. Copper is purified by electrolysis in water solution and most of the impurities in the blister copper are left behind in solution. Why can not aluminium be unpaired in a similar manner ?

A. Because Al ions are not produced in solution

B. Because Al ions are not reduced by electrolysis in a water solution

C. Because very few Al ions are reduced in water solution

D. None of the above

Answer: B



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128. Which element of Group 13 is the strongest reducing agent ?

A. B

B. Al

C. Fe

D. Ga

Answer: B



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129. When BF_3 reacts with LiH , the gaseous product produced is

A. HF

B. F_2

C. B_2H_6

D. H_2

Answer: C



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130. Which metal is protected by layer of its own

A. Gold

B. Aluminium

C. Copper

D. Iron

Answer: B



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131. Which of the following elements is the hardest?

A. Boron

B. Aluminium

C. Gallium

D. Indium

Answer: A



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132. Adamantive is the crystalline form of

A. Aluminium

B. Boron

C. Thallium

D. Beryllium

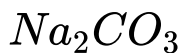
Answer: B



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133. Which of the following is not correct ?

A. In Hall's process, bauxite is fused with



B. In Serpech's process, bauxite is mixed with

coke and treated in an atmosphere of CO_2

C. In Baeyer's process, bauxite is digested with

$NaOH$ solution

D. Hoope's electrolytic cell is used for

purification of aluminium.

Answer: B



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134. Which of the following is not true about B_2H_6 ?

- A. It contains two types of $B - H$ bonds
- B. It contains one $B - B$ bond
- C. It is an electron deficient compound
- D. It contains multicentre bonds.

Answer: B



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135. Borazine (Inorganic benzene) is the product of reaction between

- A. Boron and hydrogen
- B. Boron and Ammonia
- C. Diborane and nitrogen
- D. Diborane and ammonia

Answer: D



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1. Which one of the following has the lowest m.p.?

A. B

B. Al

C. Ga

D. Tl

Answer: C



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2. Thallium shows different oxidation states due to

:

- A. it is transition element
- B. of inert pair effect
- C. of its amphoteric character
- D. of its higher reactivity

Answer: B



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3. Which of the following mineral does not contain Al?

A. Cryolite

B. Mica

C. Feldspar

D. Fluorspar

Answer: D



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4. Which of the following processes does not involve a catalyst ?

A. haber's process

B. Thermite process

C. Ostwald process

D. Contact process

Answer: B



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5. Aluminothermy used for on the spot welding of large iron structures is based upon the fact that

A. As compared to iron, aluminium has greater affinity for oxygen

B. As compared to aluminium iron has greater affinity for oxygen

C. Refraction between aluminium and oxygen is endothermic

D. Reaction between iron and oxygen is endothermic.

Answer: A



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6. Which of the following statements is not true for Al and B ?

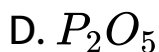
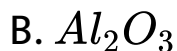
- A. They burn in oxygen to give oxides at higher temperature
- B. Their halides are Lewis acids
- C. They combine with nitrogen to form nitrides
- D. They react with HCl to form chloride.

Answer: D



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7. Which of the following oxide is amphoteric ?



Answer: B



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8. The chief ore of aluminium is

A. Cryolite

B. Feldspar

C. Kaolin

D. Bauxite

Answer: D



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9. Name a metal other than aluminium that is covered with a layer of oxide film.

A. Al

B. Ag

C. Au

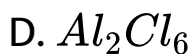
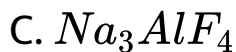
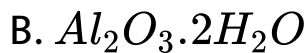
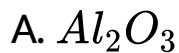
D. Fe

Answer: A



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10. The chemical formula of bauxite is



Answer: B



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11. Al_2O_3 formation from aluminium and oxygen involves evolution of a large quantity of heat, which makes aluminium use in :

- A. Deoxydiser
- B. Confectionary
- C. Indoor photography
- D. Thermite welding

Answer: D



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12. Inert pair effect plays an important role in case of

A. F

B. Al

C. Si

D. Tl

Answer: D



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13. Which member of group 13 does not exhibit the group valency in its compounds?

A. Boron

B. Aluminium

C. Gallium

D. Thallium

Answer: D



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14. In which of the following elements +1 oxidation state is more stable than +3

A. B

B. Al

C. Ga

D. Tl

Answer: D



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15. Aluminium becomes passive in

A. Conc. HNO_3

B. H_2CrO_4

C. $HClO_4$

D. All

Answer: D



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16. Which is true for an element R present in 13th group of the periodic table?

A. It is a gas at room temperature

B. It has oxidation state +4

C. It forms R_2O_3

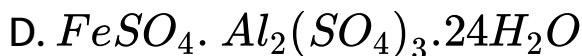
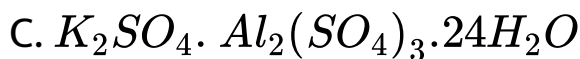
D. It forms RX_2

Answer: C



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17. An example of alum is



Answer: C



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18. Alum is not used

A. as a mordant in dyeing

B. as an insecticide

C. in purification of water

D. in tanning of leather.

Answer: B



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19. Which is used in high temperature thermometry ?

A. Na

B. Ga

C. Tl

D. Hg

Answer: B



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20. Aluminium is more reactive than iron. But aluminium is less easily corroded than iron because.

A. It is a noble metal

- B. Oxygen forms a protective oxide layer
- C. Iron undergoes reaction easily with water
- D. Fe forms mono and divalent ions.

Answer: B



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21. Aluminium vessels should not be washed with materials containing washing soda because -

- A. Washing soda is expensive
- B. Washing soda is easily decomposed

C. Washing soda reacts with Al to form insoluble aluminium oxide

D. Washing soda reacts with Al to form soluble aluminate.

Answer: D



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22. In the thermite welding process we use

A. Al powder

B. Fe powder

C. Ca powder

D. $Al + Fe_2O_3$ mixture.

Answer: A



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23. Which one of the following is a correct statement ?

A. Al is more acidic than that of B

B. B is basic while that of Al is amphoteric

C. B is acidic while that of Al is amphoteric

D. B and Al are amphoteric

Answer: C



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24. Which of the following is most abundant in the earth's crust ?

A. B

B. Al

C. Ga

D. Tl

Answer: B



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25. Duralumina is an alloy of

A. Al and Mg

B. al, Mg and Ni

C. Al, Mg, Mn, Cu

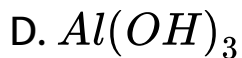
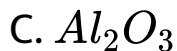
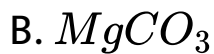
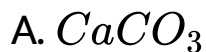
D. Al and Ni

Answer: C



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26. Which of the following is a compound of ruby ?



Answer: C



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27. Which of the following is a correct statement ?

- A. The hydroxide of aluminium is more acidic than that of boron
- B. The hydroxide of boron is basic, while that of aluminium is amphoteric
- C. The hydroxide of boron is acidic, while that of aluminium is amphoteric
- D. The hydrolysis of aluminium and boron are amphoteric.

Answer: C



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28. Which of the following statements is not true about potash alum ?

- A. Its empirical formula is $KAl(SO_4)_2 \cdot 12H_2O$
- B. Its aqueous sol. Is basic in nature
- C. It is used in dyeing industry
- D. On heating, it melts in its water of crystallisation.

Answer: B





29. Which of the following statements is incorrect ?

A. BF_3 is the weakest Lewis acid

B. Ammonal is a mixture of aluminium compounds and is used in bombs

C. BF_3 exists as dimer

D. BCl_3 donot conduct electricity in its molten state.

Answer: C



30. $AlCl_3$ exists as dimer because

- A. Al has greater ionisation potential
- B. Al has larger radius
- C. High charge in nucleus
- D. Incomplete p-subshells

Answer: D



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31. A particular element belongs to group 13 and second period of the periodic table, it is

- A. Gas, slightly metallic
- B. Liquid, non-metallic
- C. Solid, non-metallic
- D. Solid, less metallic

Answer: C



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32. Reactivity of borazole is greater than that of benzene because

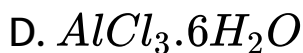
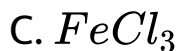
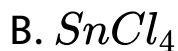
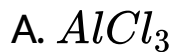
- A. borazole is non polar compound
- B. borazole is polar compound
- C. borazole is electron deficient compound
- D. of localized electrons in it.

Answer: B



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33. Which of the following is not a Lewis acid ?



Answer: D



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34. Which of the following statements is correct?

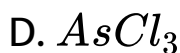
- A. BCl_3 and $AlCl_3$ are both Lewis acids and BCl_3 is stronger $AlCl_3$
- B. BCl_3 and $AlCl_3$ are both Lewis acids and $AlCl_3$ is stronger than BCl_3
- C. BCl_3 and $AlCl_3$ are both equally strong Lewis acids
- D. Both BCl_3 and $AlCl_3$ are not Lewis acids.

Answer: B



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35. Which of the following is a Lewis acid?



Answer: B



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36. Aluminium (III) chloride forms a dimer because

- A. Higher co-ordination can be achieved by Al
- B. Al has high ionisation energy
- C. Al belongs to third group
- D. It can not form a trimer

Answer: A



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37. $AlCl_3$ is

- A. Anhydrous and covalent
- B. Anhydrous and ionic

C. Covalent and basic

D. Coordinate and acidic

Answer: A



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38. $AlCl_3$ fumes in moist air because

A. It is very volatile

B. It is covalent

C. HCl is formed in moist air

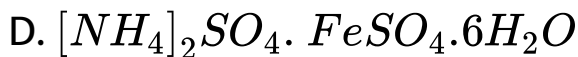
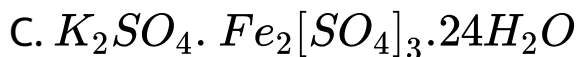
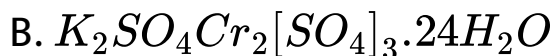
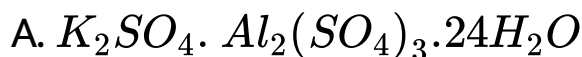
D. It is highly hygroscopic

Answer: C



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39. Which out of the following is potash alum ?



Answer: A



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40. Aluminium reacts with caustic soda to form

- A. Aluminium hydroxide
- B. Aluminium oxide
- C. Sodium meta-aluminate
- D. Sodium tetra aluminate

Answer: C



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41. Which of the following has largest size ?

A. Al

B. Al^{+}

C. Al^{2+}

D. Al^{3+}

Answer: A



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42. Boron compounds behave as Lewis acid because of their

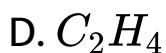
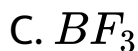
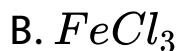
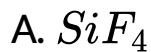
- A. acidic nature
- B. covalent nature
- C. electron deficiency
- D. ionisation property

Answer: C



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43. Which of the following is not a Lewis acid ?



Answer: D



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44. BF_3 acts as acid according to the concept of

A. Lewis

B. Bronsted

C. Arrhenius

D. None

Answer: A

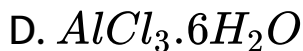
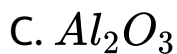


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45. $AlCl_3$ on hydrolysis gives

A. $Al_2O_3 \cdot H_2O$

B. $Al(OH)_3$



Answer: B



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46. Aluminium is most abundant in earth's crust, yet it is obtained from bauxite because

A. Bauxite is available in large quantity

B. of easy extraction of Al from it

C. Bauxite contains maximum Al

D. Bauxite is less impure

Answer: A



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47. An example of a double salt is

A. Bleaching powder

B. $K_4[Fe(CN)_6]$

C. Hypo

D. Potash alum

Answer: D



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48. In the Hoope's process for refining of Al the fused materials form three different layers and they remain separated during electrolysis also. This is because.

- A. The upper layer is kept attracted by cathode and lower layer is kept attracted by anode.
- B. There is special arrangement in cell to keep the layers separate.

C. Three layers have different densities

D. Three layers are maintained at different temperatures.

Answer: C



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49. The aqueous solution of potash alum is

A. Basic

B. Acidic

C. Neutral

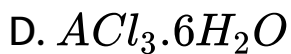
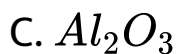
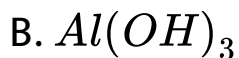
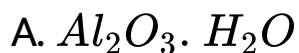
D. None of these

Answer: B



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50. $AlCl_3$ on hydrolysis gives



Answer: B



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51. Anhydrous $AlCl_3$ is prepared from

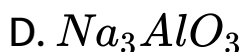
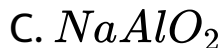
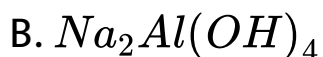
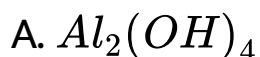
- A. Conc. HCl and Al metal
- B. Aluminium and Cl_2
- C. Dry HCl gas + heated Al metal
- D. Dil. HCl and Al metal

Answer: C



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52. Action of caustic acid soda on aluminium hydroxide gives a compound having formula

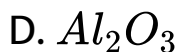
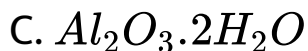
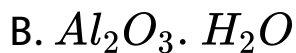
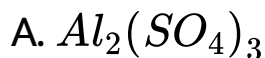


Answer: C



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53. Corundum is



Answer: D



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54. Fluorine is more electronegative than either boron or phosphorus. What conclusion can be

drawn from the fact that BF_3 has no dipole moment but PF_3 does ?

- A. BF_3 is not spherically symmetrical but PF_3 is
- B. BF_3 molecule must be linear
- C. The atomic radius of P is larger than that of B
- D. The BF_3 molecule must be planar triangular

Answer: D



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55. The purification method of bauxite containing iron oxide as impurity is known as

- A. Hoope's process
- B. Serpeck's process
- C. Baeyer's process
- D. Electrolytic process

Answer: C



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56. Which is not a mineral of aluminium

A. Anhydrite

B. Bauxite

C. Corundum

D. Diaspore

Answer: A



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57. Thallium shows different oxidation states due to :

- A. of its high reactivity
- B. of inert pair of electron
- C. of its amphoteric nature
- D. it is a transition metal

Answer: B



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58. In the electrolysis of alumina, cryolite is added to

- A. to make a conducting solution of bauxite
- B. to act as reducing agent
- C. to increase Al production
- D. to protect the anodes

Answer: A



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59. A metal ion M^{3+} loses three electrons , its oxidation number will be

A. + 3

B. + 6

C. 0

D. - 3

Answer: B



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60. The state of hybridisation of Boron in BCl_3 is

A. sp^3

B. sp^2

C. sp

D. sp^3d^2

Answer: B



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61. The types of hybridisation of boron in diborane is

A. sp -hybridisation

B. sp^2 -hybridisation

C. sp^3 -hybridisation

D. sp^3d^2 -hybridisation

Answer: C



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62. Aluminium chloride is a/an

A. Bronsted-Lowery acid

B. Arrhenius acid

C. Lewis acid

D. Lewis base

Answer: C



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63. BF_3 molecule has planar structure. Correct explanation for this is

A. BF_3 is sp^3 hybridised

B. BF_3 is sp^2 hybridised

C. BF_3 is sp hybridised

D. BF_3 is sp^3 hybridised

Answer: B



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64. Purification of aluminum by electrolysis is known as

- A. Hall's process
- B. Serpeck's process
- C. Baeyer's process
- D. Hoope's process

Answer: D



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65. Which one of the following is not a use of potash alum ?

- A. As a styptic in arresting bleeding
- B. As a pesticide
- C. As a mordant in dyeing
- D. As a coagulant for colloidal clay in water

Answer: B



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66. Bauxite is an ore of

A. Zinc

B. Copper

C. Aluminium

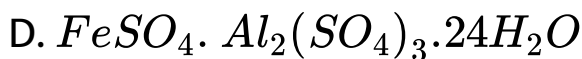
D. Iron

Answer: C



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67. Which of the following is known as pseudoalum?

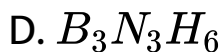
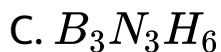
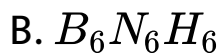
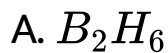


Answer: D



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68. What is the molecular formula of Borazole ?



Answer: C



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69. Aluminium reacts with concentrated HCl and concentrated NaOH to liberate the gases.....respectively.

A. H_2 and O_2

B. O_2 and H_2

C. H_2 and H_2

D. O_2 and O_2

Answer: C



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70. Which one of the following is used to remove silicon dioxide in the Serpeck's process of purification of bauxite ?

A. CaO

B. Na_2CO_3

C. Coke

D. Nickel

Answer: C



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71. Alum helps in purification water by

- A. forming Si complex with clay particles
- B. sulphate part which combines with dirt and removes it.
- C. aluminium which coagulates the mud particles
- D. making mud water soluble

Answer: C



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72. Aluminium oxide is not reduced by chemical reactions since

- A. aluminium oxide is highly stable
- B. aluminium oxide is reactive
- C. reducing agents contaminate
- D. the process pollutes the environment.

Answer: A



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73. Corundum is an ore of

A. Copper

B. Boron

C. Aluminium

D. Sodium

Answer: C

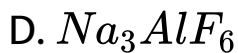
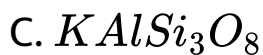


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74. The chemical composition of cryolite mineral is

A. Al_2O_3

B. $Al_2O_3 \cdot 12H_2O$



Answer: D



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75. A layer of coke is spread over bauxite during extraction of aluminium. This acts as a/an

A. Flux

B. Slag to remove impurities

C. Reducing agent

D. Insulation and does not yellow heat to escape

Answer: D



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76. Aluminium is extracted by the electrolysis of

A. Bauxite

B. Alumina

C. Alumina mixed with molten cryolite

D. Molten cryolite

Answer: C



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77. Thermite is a mixture of iron oxide and

- A. zinc powder
- B. sodium shavings
- C. potassium metal
- D. aluminium powder

Answer: D



View Text Solution

78. Which one of the following elements is a non-metal ?

A. Boron

B. Indium

C. Sodium

D. Magnesium

Answer: A



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79. Alumina is

- A. acidic
- B. Basic
- C. amphoteric
- D. none of these

Answer: C



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80. Thermite' is a mixture of X parts of ferric oxide and Y parts of aluminium powder. X, Y respectively

are

A. 3,1

B. 3,2

C. 1,1

D. 2,3

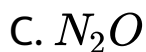
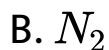
Answer: A



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81. When bauxite powder is mixed with coke and reacted with nitrogen at 2075 K, carbon monoxide

and X are formed. What is the gas formed when X is reacted with water ?

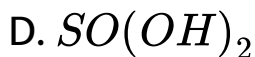
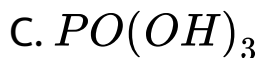
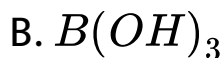
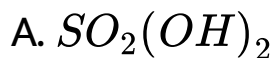


Answer: A



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82. Which of the following is not a protonic acid ?



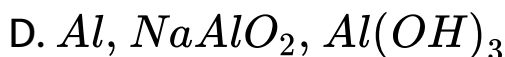
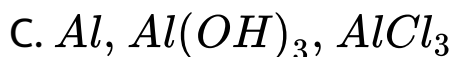
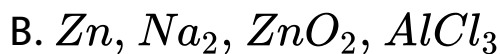
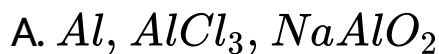
Answer: B



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83. X reacts with aqueous NaOH solution to form Y and H_2 . Aqueous solution of Y is heated to 323-33 K and on passing CO_2 into it, Na_2CO_3 and Z were

formed. When Z is heated to 1200°C , Al_2O_3 is formed. X, Y and Z respectively are



Answer: D



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84. Observe the following statements regarding purification of bauxite

I. During Hall's process, silicon is removed as Si(vapour)

II. Bauxite ore contaminated with Fe_2O_3 is purified in Baeyer's process

III. During Serpeck's process AlN is formed.

The correct answer is

A. I, II and III are correct

B. Only I and II are correct

C. Only I and II are correct

D. Only I and III are correct

Answer: D



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85. Which of the following is not correct with regard to the structure of diborane?

A. four terminal hydrogen atoms and two bridged hydrogen atoms

B. The terminal hydrogen atoms and boron atoms lie in a plane

C. Four two centre bonds and two three centre bonds

D. The sp^3 -hybrid orbitals of the boron atoms have one electron each.

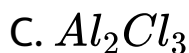
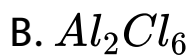
Answer: D



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86. Heating an aqueous solution of aluminium chloride to dryness will give

A. $AlCl_3$



Answer: B



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87. Alum is a water purifier because it

A. softness hard water

B. coagulates the impurities

C. destroys the pathogenic bacteria

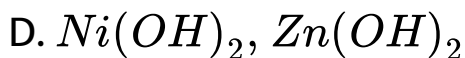
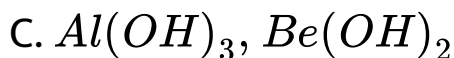
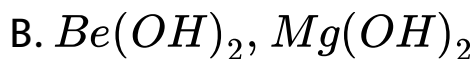
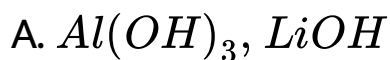
D. gives taste

Answer: B



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88. The pair of amphoteric hydroxide is



Answer: C



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89. In diborane the two $H - B - H$ angles are nearly

A. 60° , 120°

B. 95° , 120°

C. 95° , 150°

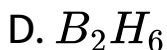
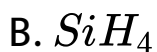
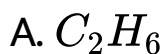
D. 120° , 180°

Answer: B



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90. Which of the following is the electron deficient molecule ?



Answer: D



[View Text Solution](#)

91. In Hall's process, the main reagent is mixed with

A. NaF

B. Na_3AlF_6

C. AlF_3

D. None of these

Answer: B



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92. Al_2O_3 can be converted to anhydrous $AlCl_3$ by heating

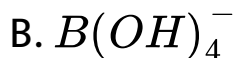
- A. Al_2O_3 with Cl_2 gas
- B. Al_2O_3 with HCl gas
- C. Al_2O_3 with $NaCl$ in solid state
- D. a mixture of Al_2O_3 and carbon in dry Cl_2 gas

Answer: D



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93. Boron cannot form which one of the following anions?

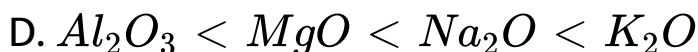
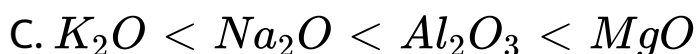
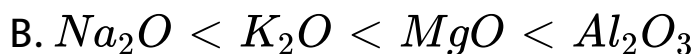
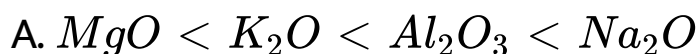


Answer: D



View Text Solution

94. Which one of the following orders presents the correct sequence of the increasing basic nature of the given oxides ?



Answer: B



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95. The species which can best serve as an initiator for the cationic polymerisation is



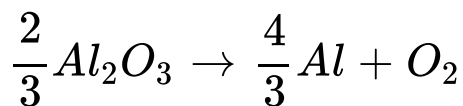
Answer: C



View Text Solution

96. The Gibb's energy for the decomposition of

Al_2O_3 at $500^\circ C$ is as follows



$$\Delta_f = 960 kJ mol^{-1}$$

The potential difference needed for the electrolytic reduction of aluminium oxide (Al_2O_3) at $500^\circ C$ is at least

A. $4.5V$

B. $3.0V$

C. $2.5V$

D. $5.0V$

Answer: C



View Text Solution

97. Which of the following is electron-deficient ?

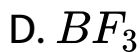
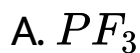


Answer: D



View Text Solution

98. Which of these is least likely to act as a Lewis base ?



Answer: D



View Text Solution

99. Predict the correct shape of BH_4^-

- A. Pyramidal, sp^3
- B. Octahedral, sp^3d^2
- C. Tetrahedra, sp^3
- D. None of the above

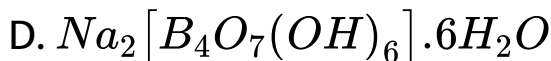
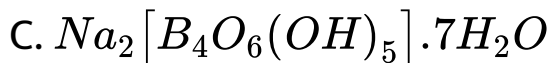
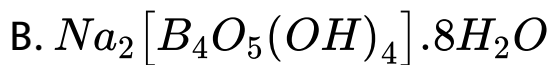
Answer: C



View Text Solution

100. The correct formula of borax is

- A. $Na_2[B_4O_4(OH)_3] \cdot 9H_2O$



Answer: B



View Text Solution

101. In borax ($Na_2B_4O_7 \cdot 10H_2O$) the number of $B - OH$ bonds present is :

A. five

B. four

C. three

D. two

Answer: B



View Text Solution

102. In diborane , the number of electrons that account for bonding in the bridges is

A. six

B. two

C. eight

D. four

Answer: D



View Text Solution

Selected Straight Objective Questions Mcqs

1. Metals commonly extracted by Gold Schmidt's alumino-thermic process is/are

A. Gold

B. Chromium

C. Iron

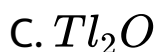
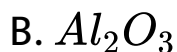
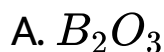
D. Maganese

Answer: B::D



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2. The distinctly basic oxides out of the following are



D. In_2O_3

Answer: C::D



View Text Solution

3. Elements of group 13 not reacting with water are

A. B

B. Al

C. Ga

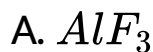
D. In

Answer: C::D



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4. Which of the following do not sublime on heating ?



Answer: A::D



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5. Which of the following atomic numbers represent group 13 elements ?

A. 13

B. 53

C. 31

D. 81

Answer: A::C::D



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6. Mark the incorrect statement. Pure alumina is

- A. a bad conductor of electricity.
- B. a good conductor of electricity
- C. an electrovalent compound.
- D. volatile in nature

Answer: A::C::D



View Text Solution

7. On heating with carbon, which of the following elements do not form carbides

A. B

B. In

C. Al

D. Ga

Answer: B::D



View Text Solution

8. The two elements which react with air readily are

A. B

B. Al

C. Ga

D. Tl

Answer: B::D



View Text Solution

9. The metals that cannot be obtained by electrolysis of the aqueous solution of their salts are

A. Ag

B. Mg

C. Cu

D. Al

Answer: B::D



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10. The major role of fluorspar, which is added in small quantities in the electrolytic reduction of Al_2O_3 dissolved in fused cryolite is

- A. as a catalyst
- B. to make the fused mixture very conducting
- C. to lower the fusion temperature of metal
- D. to decreases the ate of oxidation of carbon at the anode.

Answer: B::C



View Text Solution

11. Alum is used by dyers of clothes

- A. for fire proofing fabrics
- B. as first-aid for cuts
- C. for softening hard water
- D. as mordant

Answer: D



View Text Solution

12. In the aluminothermic process, Al acts as a/an

- A. Flux
- B. Oxidising agent
- C. Reducing agent
- D. Solder

Answer: C



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13. Thermite is a mixture of

- A. 3 parts of powdered Al and 1 part of Fe_2O_3
- B. 1 parts of powdered Al and 3 part of Fe_2O_3

C. 1 parts of powdered Al and 1 part of Fe_2O_3

D. 2 parts of powdered Al and 1 part of Fe_2O_3

Answer: B



View Text Solution

14. Hydrogen will not reduce

A. Heated cupric oxide

B. Heated ferric oxide

C. Heated stannic oxide

D. Heated aluminium oxide

Answer: D



View Text Solution

15. In the electrolysis of alumina, cryolite is added to

- A. lower the melting point of alumina
- B. increase the electrical conductivity
- C. minimise anodic effect
- D. Both (A) and (B)

Answer: D



[View Text Solution](#)

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

A. H^{+} ions

B. Ca^{2+}

C. Mg^{2+}

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

Answer: D



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17. In which of the following minerals, Al is not present

A. Cryolite

B. Mica

C. Feldspar

D. Fluorspar

Answer: D



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18. In commercial electrochemical process for Al extraction, electrolyte used is

- A. $Al(OH)_3$ in $NaOH$ solution
- B. An aqueous solution of $Al_2(SO_4)_3$
- C. A molten mixture of Al_2O_3 and Na_3AlF_6
- D. A molten mixture of $Al(OH)_3$ and $AlO(OH)$

Answer: C



View Text Solution

19. Electrolytic reduction of alumina to aluminium by Hall-Heroult process is carried out

- A. In the presence of $NaCl$
- B. In the presence of fluorite
- C. In the presence of cryolite which forms a melt
lower melting temperatures
- D. In the presence of cryolite which forms a melt
with high melting temperature.

Answer: A



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20. H_3BO_3 is

















- A. monobasci and weak Lewis acid
- B. monobasic and weak Bronsted acid
- C. monobasic and strong Lewis acid
- D. tribasic and weak Bronsted acid

Answer: A



View Text Solution

1. Here each question contains statements given in two columns which have to be matched. Statements in Column I are labelled as A, B, C and D whereas the statements the Column II are labelled as p, q, r and s. The answers to these questions are to be appropriately bubbled as illustrated below in the following example. If the correct matches are a-p, A-s, B-q, B-r, C-p, C-q and D-p, their correctly labelled 4×4 matrix should look like :

	<i>p</i>	<i>q</i>	<i>r</i>	<i>s</i>
A				
B				
C				
D				

Column I

- (A) $[\text{Bi}]^{3+} \rightarrow [\text{BiO}]^{+}$
 (B) $[\text{AlO}_2]^{3+} \rightarrow \text{Al}(\text{OH})_3$
 (C) $[\text{SiO}_4]^{4-} \rightarrow \text{Si}_2\text{O}_7^{6-}$
 (D) $[\text{B}_4\text{O}_7]^{2-} \rightarrow \text{B}(\text{OH})_3$
 water

















Column II

- (*p*) Heat
 (*q*) Hydrolysis
 (*r*) Acidification
 (*s*) Dilution of



View Text Solution

2. Here each question contains statements given in two columns which have to be matched. Statements in Column I are labelled as A, B, C and D whereas the statements the Column II are labelled as p, q, r and s. The answers to these questions are to be appropriately bubbled as illustrated below in the following example. If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-p, their correctly labelled 4×4 matrix should look like :

	<i>p</i>	<i>q</i>	<i>r</i>	<i>s</i>
A				
B				
C				
D				

Column I

(A) B_2H_6

(B) BF_3

(C) AlCl_3

(D) H_3BO_3

Column II

(*p*) Borax

(*q*) Lewis Acid

(*r*) $p\pi-p\pi$ back bonding

(*s*) NaBH_4



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Integer Type Questions

1. Number of B-O-B bonds in borax is.....



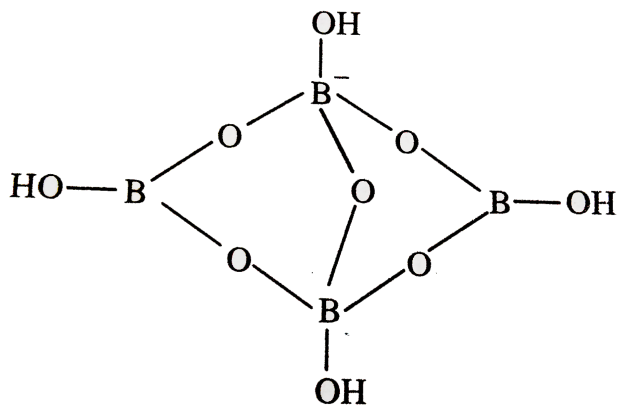
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2. Number of metals present in 'alnico' alloy is



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3. $B - H - B$ bridge in B_2H_6 is formed by sharing of number of electrons equal to.....



[View Text Solution](#)

4. Basicity of boric acid is



[View Text Solution](#)

Reason Assertion Type Questions Mcqs

1. Assertion (A) : $B(OH)_3$ is acidic while $In(OH)_3$ is basic.

Reason (R) : $B(OH)_3$ has highly H-bonded network structure.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C



View Text Solution

2. Assertion (A) : $Al(OH)_3$ is amphoteric in nature.

Reason (R) : $Al - O$ and $O - H$ bonds can be broken with equal ease in $Al(OH)_3$.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



View Text Solution

3. Assertion (A) : $B(OH)_3$ is weakly basic.

Reason (R) : B-O bonds can be broken easily.

A. Both A and R are true and R is the correct explanation of A

- B. Both A and R are true but R is not a correct explanation of A
- C. A is true but R is false
- D. Both A and R are false.

Answer: D



View Text Solution

4. Assertion (A) : Ionisation energy ($I. E_1$) of Ga is less than Al.

Reason (R) : Ga has a larger atomic size than Al.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not a correct explanation of A
- C. A is true but R is false
- D. Both A and R are false.

Answer: D



View Text Solution

5. Assertion (A) : Tl^{3+} acts as an oxidising agent.

Reason (R) : Due to inert pair effect Tl^{+} is more stable than Tl^{3+} .

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



6. Assertion (A) : Boric acid behaves as a weak monobasic acid.

Reason (R) : Boric acid contains H-bonds in its structure.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: B



View Text Solution

7. Assertion (A) : Al forms $[AlF_6]^{3-}$ ions but B does not form $[BF_6]^{3-}$ ions.

Reason (R) : B does not react with F_2 .

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: C



View Text Solution

8. Assertion (A) : $Tl(OH)_3$ is more basic than $TlOH$.

Reason (R) : It can be explained on the basis of Fajan's rule.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not a correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

Answer: D



View Text Solution

9. Assertion (A) : H_3BO_3 is a tribasic weak acid.

Reason (R) : B is a typical non-metal.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. Both A and R are false.

Answer: D



View Text Solution

10. Assertion (A) : Thhe compound called inorganic benzene s borazine.

Reason (R) : Borazine has a structure similar to benzene.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



View Text Solution

11. Assertion (A) : Boron always forms covalent bond.

Reason (R) : The small size of B^{3+} favours formation of covalent bond.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not a correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A



View Text Solution

12. Assertion (A) : In water, orthoboric acid acts as a weak monobasic acid.

Reason (R) : In water orthoboric acid acts as a proton donor.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true but R is not a correct explanation of A
- C. A is true but R is false
- D. A is false but R is true

Answer: C



View Text Solution

Ultimate Preparatory Package

1. H_3BO_3 when dissolved in heavy water gives

A. D_3O^+ ion

B. H_3O^+ ions

C. HD_2O^+ ions

D. DH_2O^+ ions.

Answer: A



View Text Solution

2. TlI_3 is a black coloured sparingly soluble ionic compound. In its aqueous solution, it will give

A. Tl^+ gives I_3^- ions

B. Tl^{3+} and I^- ions

C. Tl^+ , I^- ions and I_2

D. Tl^+ and I^- ions

Answer: A



View Text Solution

3. Anodized aluminium is aluminium

A. obtained on anode

B. alloy, containing 98% aluminium

C. electrolytically coated with aluminium oxide

D. None of these

Answer: C



View Text Solution

4. In meta-aluminates, co-ordination number of aluminium is

A. 3

B. 6

C. 1

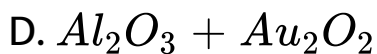
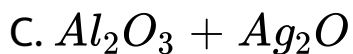
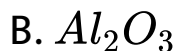
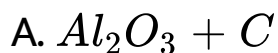
D. 4

Answer: B



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5. Rubies and sapphires are essentially

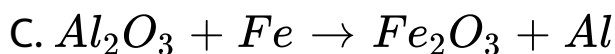
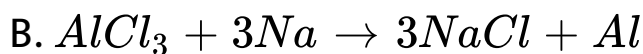
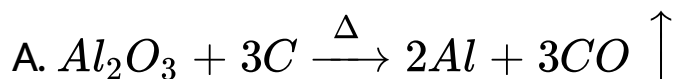


Answer: B



View Text Solution

6. Which of the following can be used for the isolation of aluminium ?



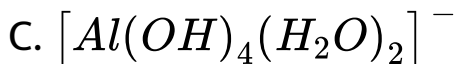
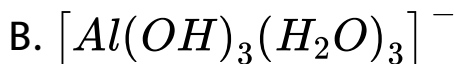
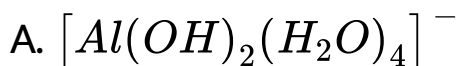
D. None

Answer: A



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7. Correct representation of meta-aluminate ion is



D. None of these

Answer: C



[View Text Solution](#)

8. Aluminium alloy with beautiful golden yellow colour used for making artificial jewellery is

A. Duraalumin

B. Magnalium

C. Alclad

D. Aluminium bronze

Answer: D



View Text Solution

9. Goldschmidt's aluminothermic process is not used for the extraction of the metal

A. chromium

B. manganese

C. tungsten

D. iron

Answer: D



View Text Solution

10. The ignition mixture used in aluminothermy is a mixture of

A. Mg powder + Na_2O_2

B. Al powder + BaO_2

C. Al powder + Na_2O_2

D. Mg powder + BaO_2

Answer: B



View Text Solution

11. Group 13 element with lowest melting point is

A. B

B. Tl

C. Al

D. Ga

Answer: D



View Text Solution

12. Out of the following group 13 elements, element with smallest atomic radius is

A. Al

B. Ga

C. In

D. Tl

Answer: B



View Text Solution

13. Of all the Group 13 elements, the element with lowest electronegativity is

A. B

B. Tl

C. In

D. Al

Answer: D



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