CHEMISTRY

BOOKS - PATHFINDER CHEMISTRY (BENGALI ENGLISH)

SOME P-BLOCK ELEMENTS

Question Bank

1. The relative stabilities of M^+ cations of Group 13 are $B^+ < Al^+ < Ga^+ < In^+ < TI^+$-

Explain.

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2. B^{+3} ion does not exist -Why?

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3. Why does BF_3 behave as Lewis acid?

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4. Boron halides in spite of being electron deficient do not exist as dimer-Explain.

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5. The actual order of acidic strengths of boron halide is $BI_3 > BBr_3 > BCl_3 > BF_3$-Why?

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6. Why Boron exhibit anomalous behaviour?

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7. Why two H-bridge bonds are present in diborane?

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8. How is diborane prepared from $NaBH_4$?

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9. Write two uses of borax in industry.

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10. Boric acid is a weak acid-Why?

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11. Give example of production of an acidic and a neutral oxide of a non-metal on dehydration of an organic acid.

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12. Write equations for hydrolysis of BCI_3 and BN in boiling water.

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13. How can you detect boric acid?

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14. What happens when AI is heated with alkali?

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15. Describe the shapes of BF_3 and BF_4^-

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16. $AlCl_3$ exists as a dimer when

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17. Explain why Aluminium is of great demand in industry?

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18. State what happens when B_2O_3 and Mg powder are fused together and the product is boiled with dilute HCl.

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19. Why the elements of Group 14 have high melting points than the elements of group 13.

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20. $SnCl_2$ is an ionic solid while $SnCl_4$ is a covalent liquid at room temperature - Explain.

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21. How carbon differs from other elements of group 14?

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22. Dimond is non conductor of electricity but Graphatite is a conductor of electricity explain.

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23. Why carbon exhibits catenation character more than other elements of group 14?

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24. Write the resonating structure for CO_3^{2-} and HCO_3^- .

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25. What are Fullerenes?

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26. State what happens when orthoboric acid is heated gradually.

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27. Carbon monoxide has reducing property while carbon dioxide acts as oxidising agent - Why?

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28. Why is carbone monoxide toxic?

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29. How can you get pure CO from potassium ferrocyanide?

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30. Why is dilute H_2SO_4 not used in the Laboratory preparation of CO_2?

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31. How can you separate CO from a mixture of CO and CO_2?

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32. Why $SiCl_4$ behaves as a Lewis acid?

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33. What are Zeolites?

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34. What is tetra chloro silico methane? How it can be prepared from Silica?

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35. What are Silicones? Why are they so called?

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36. What are silicates?

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37. Explains why CO_2 is gaseous while SiO_2 is a Solid?

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38. Write two uses of Silicones.

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39. Why BF_6^{3-} does not exist, explain.

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40. White fumes appear when bottles containing anhydrous $AlCl_3$ is opened for a fraction of time. Explain.

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41. Explain why $Ga(+1)$ undergoes disproportionation reaction.

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42. How the oxide of group 13 differ in their nature ? State with examples.

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43. Why is atomic radius of Gallium less than that of Aluminium ?

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44. How can borax be prepared from colemanite ?

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45. Write the correct formula of borax and structure of it's anion.

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46. Explain the phenomenon : "When phenolphethaline is added to aqueous solution of Borax the colour of the solution changed to pink which is again turn colourless if glycerol is added to it

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47. What is the shape of BO_3^{-3} ion ?

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48. How will BCI_3 and $\mathbb{C}I_4$ will react with water ?

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49. What is the type of hybridisation of Boron in diborane ?

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50. Give reasons

Conc. HNO_3 can be transported in aluminium container.

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51. Give reasons

Graphite is used as lubricant.

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52. Give reasons

Aluminium utensils should not be kept in water overnight.

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53. Give reasons

$\mathbb{C}l_4$ is used in fire extinguisher.

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54. Give reasons

Stannous chloride and Ferric chloride cannot be kept in same container.

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55. Write balanced equation for the following

$BF_3 + LiH \rightarrow$

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56. Write balanced equation for the following

$B_2H_6 + H_2O \rightarrow$

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57. Write balanced equation for the following

$NaH + B_2H_6 \rightarrow$

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58. Write balanced equation for the following

$B_2H_6 + NH_3 \rightarrow$

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59. Write balanced equation for the following

$Al_4C_3 + 12H_2O \rightarrow$

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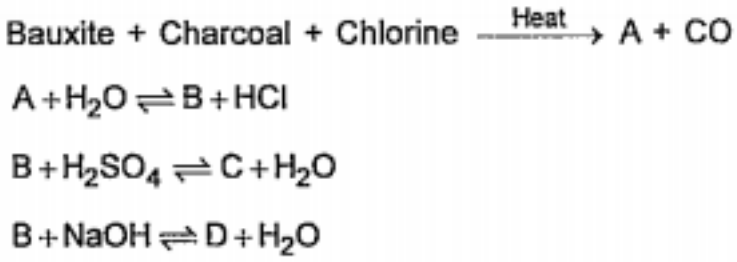
60. Identify A,B, C, D in the following reactions.



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61. What happens when silica is treated with HF ?

Give equation.

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62. A metal 'X' on treatment with NaOH forms a white precipitate (A) which is soluble in excess of NaOH to yield complex (B). (A) is soluble in HCI to produce (C). On strong heating (A) gives (D) from which the metal is extracted. Identity X, A, B, C, D and write the equation involved.

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63. Explain:

Silicon forms SiF_6^{2-} but corresponding fluoro compound of carbon is not known.

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64. Explain:

$BCl_3 \xrightarrow{HOH} [B(OH)_4]$ but

$AlCl_3 \xrightarrow[H^+]{HOH} [Al(H_2O)_6]^{3+}$

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65. If the starting material for manufacture of silicones is $RSiCl_3$ then write structure of product formed.

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66. What is inorganic graphite? Why is it so called?

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67. Why B-F bond lengths in BF_3 and BF^-_4 differ ?

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68. $PbCl_2$ is more stable than $PbCl_4$ - Why?

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69. Trisillylamine is a weaker base than trimethylamine-Why?

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70. Out of CO and CO_2 which acts as an ligand and why?

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71. What do you mean by oil dag and aqua dag ? Write their uses.

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72. What happens when (State with equation)

At $200^{\circ}C$ under high pressure CO is passes through caustic soda solution and the product is heated again to $300^{\circ}C$.

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73. What happens when Silicon is heated with methyl chloride at high temperature in the presence of copper. (give equation)

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74. Identify the compound A, X and Z in the following.

$A + 2HCl + 5H_2O \rightarrow 2NaCl + X$

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75. Identify the compound A, X and Z in the following.

(b) $X \xrightarrow[370K]{\Delta} HBO_2 \xrightarrow[>370K]{\Delta} Z$

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76. Complete the following:

$$- - - + 3LiAiH_4 \rightarrow - - - + 3LiF + 3AiF_3$$

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77. Complete the following:

$$- - - + 6H_2O \rightarrow - - - + 6H_2$$

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78. Complete the following:

$$- - - + 3O_2 \xrightarrow{\triangle} B_2O_3 + 3H_2O$$

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79. Describe the shapes of BF_3 and BF_4^-

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80. Is boric acid a protonic acid ? Explain.

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81. What is importance of highly pure silicon? How can it be prepared?

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82. Alkanes are large in number but Sillanes are comparatively few- Why?

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83. What are silicates? Give one example each of orthosilicate and pyrosilicate with their structures.

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84. What happens when (Give equation)

Calcium carbonate is strongly heated with coke.

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85. What happens when (Give equation)

Carbon monoxide gas is passed oven finely divided nickel.

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86. Why is the CO_2 molecule non polar?

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87. Write down the condition and equation of the reaction between ammonia and diborane. Why is the product called inorganic benzene?

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88. A mixture of CO and CO_2 gas is there. How would you convert the whole mixture to Carbon Dioxide

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89. A mixture of CO and CO_2 gas is there. How would you convert the whole mixture to Carbon monoxide.

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90. Which compound on heating gives pure BF_3?

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91. What are Carbogen and smelling salt? Give one use of each of them.

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92. Between AIF_3 and $AlCl_3$ which has greater melting point?

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93. Anhydrous $AlCl_3$ is a covalent compound but hydrated aluminium chloride is an ionic

compound-Explain Why ?

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94. $PbCl_4$ is a stable compound but Pbl_4 has no existance. Explain Why?

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95. What is tynchal? Give its chemical formula.

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96. How would you remove

CO_2 from a mixture of CO_2 and SO_2

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97. Write the formula of Kaolinite.

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98. What is sheet silicate?

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99. Explain why anhydrous aluminium chloride cannot be prepared by heating hydrated aluminium chloride?

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100. Explain why BF_3 does not undergo hydrolysis.

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101. Among the group-14 elements which one form $p\pi - p\pi$ multiple bond?

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102. Give one example of each of the following.

Additives property of carbon monoxide.

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103. Give one example of each of the following.

Oxidising property of carbon dioxide.

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104. Give one example of each of the following.

Reducing property of carbon monoxide.

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105. What is carbonado?

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106. Which compound is produced on complete combustion of graphite?

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107. Why is the aqueos solution of borax alkaline?

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108. What happens when mixture of CO_2 and NH_3 gas is passed through a slurry of powdered gypsum in water?

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109. What is the chemical formula of borax bead?

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110. $CCl4$ does not undergo hydrolysis but $SiCl_4$ undergoes ready hydrolysis -Why?

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111. How can you detect the presence of a very small amount of CO in air?

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112. What is boran bead?

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113. What happened when excess CO_2 gas is passed through the brine solution saturated with ammonia. Write with equation.

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114. TlCl compound is known but AlCl is not why?

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115. $B_2H_6 + 3O_2 \rightarrow ?$

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116. Why are the dihalides of carbon unstable but the dihalides of tin and lead are stable?

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117. What happened when at first small amount of NaOH solution and then excess amount of NaOH solution is allowed to mix with aqueous solution of `Al2(SO4)3?

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118. Which is the purest allotrope of carbon?

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119. How would you identify boric acid or borate ion?

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120. Why PbO_2 is an oxidising agent.

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121. Draw the structure of diborane and show how many (3C-2e) bond exist in it.

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