CHEMISTRY

BOOKS - JMD CHEMISTRY (PUNJABI ENGLISH)

THE p-BLOCK ELEMENTS

Example

1. Which of the following pentafluorides cannot be prepared?

A. PF_5

B. AsF_5

C. SbF_5

D. BiF_5

Answer: D

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2. Maximum covalency of sulphur is :

A. 2

B. 4

C. 6

D. 8

Answer: C

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3. Which one of the following is tailing of mercury?

A. N_2O

B. SiO_2

C. Hg_2O

D. None of these

Answer: C

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4. The basicity of phosphorus acid is :

A. Two

B. Three

C. One

D. Zero

Answer: A

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5. The correct order of thermal stability of hydrogen halides (HX) is: $HI > HBr > HCL > HF$, $HF > HCL > HBr > HI$,

$HCL < HF < HBr < HI,$

$HI > HCL > HF > HBr.$

A. $HI > HBr > HCL > HF$

B. $HF > HCL > HBr > HI$

C. $HCL < HF < HBr < HI$

D. $HI > HCL > HF > HBr$

Answer: B

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6. The correct order of acid strength is

A.

$$HClO_4 < HClO_3 < HClO_2 < HClO$$

B.

$$HClO < HClO_2 < HClO_3 < HClO_4$$

C.

$$HClO_4 < HClO < HClO_2 < HClO_3$$

D.

$$HClO_2 < HClO_3 < HClO_4 < HClO$$

Answer: B

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7. The correct order of acidic strength is

A. $H_2O < H_s < H_2Se < H_2Te$

B. $H_O > H_2S > H_2Se > H_2Te$

C. $H_S > H_2O > H_2Te > H_2Se$

D. $H_2Te < H_2S < H_2O < H_2Se$

Answer: A

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8. SO_2 acts as oxidising and reducing agent.

A. SO_2

B. SO_3

C. H_2S

D. None of these

Answer: A

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9. Oleum is :

A. castor oil

B. oil of Vitriol

C. fuming H_2SO_4

D. None of these

Answer: C

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10. Sulphur molecule is : diatomic, tetratomic, triatomic, octatomic.

A. diatomic

B. tetratomic

C. triatomic

D. octatomic

Answer: D

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11. Which member of the halogen family(X_2) does not show positive oxidation state $\left(X_2^+\right)$?

A. Fluorine

B. Chlorine

C. Bromine

D. Iodine

Answer: A

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12. Bleaching action of chlorine is due to :

A. reduction

B. hydrogenation

C. chlorination

D. oxidation

Answer: D

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13. Which of the following bonds is the strongest? $F-F, Cl-Cl, I-I, Br-Br.$

A. $F-F$

B. $Cl-Cl$

C. $I-I$

D. $Br-Br$

Answer: B

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14. Sea divers go deep in the sea water with a mixture of

which of the following gases?

A. $O_2$and He

B. O_2 and Ar

C. O_2 and CO_2

D. CO_2 and Ar

Answer: A

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15. Which is the least polarisable among all the noble gases?

A. He

B. Xe

C. Ar

D. Ne

Answer: A

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16. Shape of $XeOF_4$ is :

A. octahedral

B. square pyramidal

C. pyramidal

D. T-shaped

Answer: B

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17. Among trihalide of nitrogen,which one is least basic? NF_3, NCl_3, NBr_3, NI_3.

A. NF_3

B. NCl_3

C. NBr_3

D. NI_3

Answer: A

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18. What is maximum no. of hydrogen bonds in which a

water molecule may participate is :

A. 1

B. 2

C. 3

D. 4

Answer: D

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19. Which of the following element has maximum electron gain enthapy(negative)? $F, Cl, Br, I.$

A. F

B. Cl

C. Br

D. I

Answer: B

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20. Halogens have maximum negative electron gain enthalpy in the respective periods of the periodic table. Why ?

A. F

B. Cl

C. Br

D. I

Answer: A

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21. Which of the following has highest ionisation enthalpy? $P, N, As, Sb.$

A. P

B. N

C. As

D. Sb

Answer: B

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22. General electronic configuration of element of Group 16 is :

A. ns^2np^6

B. ns^2np^4

C. ns^2np^5

D. ns^2np^2

Answer: B

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23. Among the following which is the strongest oxidising agents: Br_2, I_2, F_2, Cl_2.

A. Br_2

B. I_2

C. Cl_2

D. F_2

Answer: D

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24. Which of the following does not exist? $XeOF_4, NeF_2, XeF_2, XeF_6.$

A. $XeOF_4$

B. NeF_2

C. XeF_2

D. XeF_6

Answer: B

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25. Which of the following oxides of nitrogen is called laughing gas ?

A. NO_2

B. N_2O

C. N_2O_3

D. N_2O_5

Answer: B

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26. What is the basicity of H_3PO_2 and why ?

A. 1

B. 2

C. 3

D. 4

Answer: A

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27. The basicity of phosphorus acid is :

A. Two

B. Three

C. One

D. Zero

Answer: A

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28. Oleum is: $H_2S_2O_7$, $H_2S_2O_6$, $H_4S_2O_7$, $H_3S_2O_7$.

A. $H_2S_2O_7$

B. $H_2S_2O_6$

C. $H_4S_2O_7$

D. $H_3S_2O_7$

Answer: A

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29. Oil of vitriol is: $CuSO_4$, H_2SO_4, $Al_2(SO_4)_3$, Na_2SO_4.

A. $CuSO_4$

B. H_2SO_4

C. $Al_2(SO_4)_3$

D. Na_2SO_4

Answer: B

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30. Which of the following have lowest boiling point ?

A. He

B. Ne

C. Ar

D. Na

Answer: A

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31. Why NH_3 is less basic than PH_3?

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32. H_3PO_2 is monoprotic acid. Explain.

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33. SO_2 has zero dipole moment.

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34. Oleum is pyrosulphuric acid.

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35. SO_2 acts as oxidising and reducing agent.

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36. Why HF is a weak acid ?

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37. Cynogen is a pseudohalogen.

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38. Bond dissociation energy of F_2 is less than Cl_2.

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39. In XeO_3,O.S. Of Xe is $+6$.

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40. Hydrolysis of XeF_6 is a redox reaction.

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41. Define inert pair effect.

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42. Given reason: H_3PO_4 is triprotic acid but H_3PO_3 is diprotic acid. Why?

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43. What is the basicity of H_3PO_3 ?

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44. Why ammonia is a good complexing agent?

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45. Explain why the first element of a group differ

from other elements of Its group.

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46. Why does Nitrogen show anomalous behaviour in its group ?

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47. Why is phosphorus solid and reactive, bnut nitrogen is a gas and inert?

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48. Draw the structure of $H_2S_2O_7$.

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49. Why does NH_3 form hydrogen bonds but PH_3 does

not ?

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50. PH_3 has lower boiling point than NH_3. Why?

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51. Though nitrogen exhibits + 5 oxidation state, it does not form penta-halide. Given reason.

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52. PCl_5 exists but NCl_5 does not exist why

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53. Why is NH_3 more basic than PH_3 ?

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54. All the five bonds in PCl_5 are not equivalent justify.

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55. On the basis of hybridisation discuss the structure of

$PC1_5$.

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56. What happens when white phosphorus is heated

with concentrated NaOH solution in an inert

atmosphere of

CO_2 ?

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57. Explain the difference in the structures of white

and red phosphorus.

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58. How do you account for the reducing behaviour

of H_3P0_2 on the basis of its structure ?

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59. What is basicity of H_3PO_4?

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60. What is the basicity of H_3PO_2 and why ?

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61. Though nitrogen exhibits + 5 oxidation state, it does not form penta-halide. Given reason.

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62. Why are pentahalides more covalent than trihalides ?

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63. Why does ammonia act as a lewis base?

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64. Why does NO_2 dimerise ?

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65. Draw the structure of N_2O_5. What is the covalency

of nitrogen in N_2O_5 ?

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66. Why does nitrogen show catenation properties

less than phosphorus ?

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67. Why white or yellow phosphorus is always kept

under water ?

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68. Nitric oxide becomes brown when released in air.

Explain why ?

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69. NO (Nitric oxide) is paramagnetic in the gaseous

slate but diamagnetic in the liquid and solid states. Why ?

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70. Why does the reactivity of nitrogen differ from

the phosphorus ?

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71. Molecular nitrogen is not particularly and reactive. Why?

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72. Describ chemistry of manufacture of ammonia by Haber's process and discuss conditions for good yield of ammonia.

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73. Describe Ostwald's process for the manufacture

of nitric acid. Give important uses of nitric acid.

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74. What is aqua regia ?

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75. Illustrate how copper metal can give different

products on reaction with HNO_3.

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76. The HNH angle value is higher than HPH, HAsH

and HSbH angles. Why

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77. Explain why NH_3 is basic but BiH_3 is only feebly basic.

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78. Why is oxygen a gas while sulphur is a solid at room temperature?

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79. Sulphur shows +4 and +6 oxidation state in their

compounds but oxygen can not show these oxidation states.

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80. H_2S is a gas but H_2O is liquid at room temperature. Explain.

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81. Discuss anomalous character of oxygen.

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82. Why is H_2S less acidic than H_2 Te ?

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83. Why does ozone (0_3) acts as a powerful oxidising

agent ? Give examples.

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84. Why does ozone (0_3) acts as a powerful oxidising

agent ? Give examples.

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85. Why does ozone (0_3) acts as a powerful oxidising agent ? Give example with potassium iodide.

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86. Why does ozone (0_3) acts as a powerful oxidising agent ? Give examples acidified ferrous sulphate.

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87. Why does ozone (0_3) acts as a powerful oxidising agent ? Give examples black lead sulphide.

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88. Describe the manufacture of H_2SO_4 by Contact

process and give its important uses.

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89. Give an example of a reaction in which H_2SO_4

behaves as :

a strong acid.

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90. Give an example of a reaction in which H_2SO_4 behaves as :

a dehydrating agent.

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91. Give an example of a reaction in which H_2SO_4

behaves as :

an oxidising agent.

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92. Elements of Group 16 generally show lower value

of first ionisation enthalpy compared to the corresponding

periods of Group 15. Why ?

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93. Explain that SO_2 can act as an oxidising agent as well as a reducing agent, but SO_3 can act as an oxidising agent only.

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94. What is oleum ? Draw its structure.

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95. Draw the sturcture of one oxo acid of sulphur.

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96. Explain H_2SO_4 acid is dibasic. Draw structure.

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97. SO_3 has zero dipole moment. Why ?

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98. Discuss the structure of SF_6 on the basis of hybridisation.

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99. Why conc. H_2SO_4 is viscous and has high boiling point?

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100. Which form of sulphur shows paramagnetic behaviour and why ?

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101. Comment on nature of two S-O bond formed in SO_2 molecule. Are the two S-O bonds in this molecule equal ?

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102. Why SF_6 is known but SH_6 is not known ?

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103. Among the hydrides of Group 16, water shows unusual physical properties. Why ?

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104. Explain the following :

SCl_6 is not known but SF_6 is known. Why ?

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105. Explain the following :

OF_6 does not exist and SF_6 exists. Why ?

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106. Give two examples to show the anomalous behaviour of fluorine.

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107. Why ClF_3 exists, but FCl_3 does not exist ?

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108. Why halogens are coloured gases and they are very reactive ? Comment on it.

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109. Bond dissociation energy of F_2 is less than Cl_2.

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110. Explain the following :

Iodine is more soluble in KI solution than in water.

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111. Explain the following :

Fluorine does not show positive oxidation state.

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112. What are pseudohalogens ? Give example.

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113. Explain: Electron gain enthalpy of chlorine is more negative than fluorine.

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114. Why electron affinity of fluorine is less than that of chlorine ?

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115. What are interhalogen compounds ? How interhalogen compounds are prepared ?

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116. What are the interhalogen compounds ? Why are these more reactive than halogens ?

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117. Why ICl_3 is more reactive than I_2 ?

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118. ICI_7 does not exist wile IF_7 exists. Why ?

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119. Boiling point of HCI is lower than HF. Explain why ?

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120. Why are halogens coloured ?

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121. Halogens have maximum negative electron gain enthalpy in the respective periods of the periodic table. Why ?

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122. Although electron gain enthalpy of fluorine is less

negative as compared to chlorine, fluorine is a stronger

oxidising agent than chlorine. Why ?

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123. Considering the parameters such as bond dissociation enthalpy, electron gain enthalpy

and hydration enthalpy, compare the oxidising power of F_2 and Cl_2.

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124. Why is fluorine a very reactive halogen ?

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125. Fluorine exhibits only - 1 oxidation state whereas other halogens exhibit positive oxidation states such as +1, +3, +5, +7.

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126. Write the balanced chemical equation for the reaction

of CI_2 with hot and conc. NaOH. Is this reaction

disproportionation reaction ? Justify.

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127. Write the balanced chemical equations for the reaction of Cl_2 with, cold and dil. NaOH.

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128. Write the balanced chemical equation for the reaction of CI_2 with hot and conc. NaOH. Is this

reaction

disproportionation reaction ? Justify.

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129. Draw structure of BrF_3.

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130. Give the shape of ClF_3.

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131. Compare the acidic strength of $HClO_4$, $HClO_3$, $HClO_2$, HClO. Give reasons.

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132. Arrange $HClO_4$,$HClO_3$,$HClO_2$,$HClO$ in order of

oxidising power

Give reason.

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133. Arrange the following in order of property indicated for each set :

F_2,Cl_2,Br_2,I_2 -increasing bond dissociation enthalpy.

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134. Arrange the following in order of property indicated for each set :

HF,HCI, HBr, HI - increasing acid strength.

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135. With what neutral molecule is ClO^- isoelectronic? Is that molecule a Lewis base?

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136. What inspried N. Bartlett for carrying out reaction between Xe and PtF_6 ? Write the reaction also.

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137. Noble gases have low boiling points. Explain.

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138. Why elements of Group 18 are less reactive or

inert ?

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139. Why are the elements of Group 18 known as noble gases ?

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140. Why electron gain enthalpies of noble gases are

large positive ?

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141. Why noble gases have very high values of ionisation enthalpies ?

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142. Give the preparation, hybridisation and structure of XeF_4 (XenonTetrafluoride)

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143. Draw the structure of $XeOF_2$

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144. Hydrolysis of XeF_6 is a redox reaction.

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145. How are Xenon fluorides XeF_2, XeF_4 and XeF_6 prepared ?

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146. Draw the structure of XeF_2, XeF_4 and XeF_6.

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147. How are XeO_3 and $XeOF_4$ prepared?

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148. Discuss the shapes of XeO_3 and $XeOF_4$ on the

basis of VSEPR theory.

149. List the uses of noble gases.

150. Out of noble gas, only xenon is known to form chemical compound. Explain.

151. Why do noble gases form compounds with fluorine and oxygen ?

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