



# CHEMISTRY

## BOOKS - PATHFINDER CHEMISTRY (BENGALI ENGLISH)

### HYDROGEN

#### Question Bank

1. What are the isotopes of Hydrogen?



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2. What are the allotropes of Hydrogen? Give the difference between them.



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3. Give an example of ionic and covalent hydrides.



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4. What is hydrolith ?Give its chemical reaction with water?



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5. Give the reaction for preparation of hydrogen from alkali?



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6. What is hydrogenation ?Give the reaction



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7. What is hydroformylation? Give the reaction.



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8. Give two example of Hydrolysis reaction.



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9. How will you obtain high purity (99.95 %) dihydrogen?



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10. Name a compound of hydrogen and oxygen showing stronger acidic behaviour than water?



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11. Why can't animals live in distilled water?



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12. Out of  $H_2SO_4$  and  $H_3PO_4$  which is preferred in preparation of  $H_2O_2$  from  $BaO_2$ ?



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13. Acetanilide checks the decomposition of  $H_2O_2$ . What is the nature of the compound.



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14. What is understood by hydride gap?



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15. HCl is added to the following oxides. Which one would give  $H_2O_2$ ?

A.  $MnO_2$

B.  $PbO_2$

C. BaO

D. none of the above

**Answer:**



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**16.** Which of the following is the true structure of  $H_2O_2$ ?

A. H-O-O-H

B. 



C. 

D. 

**Answer:**



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**17.** Which of the following can not be oxidized by  $H_2O_2$ ?

A.  $KI+HCl$

B.  $O_3$

C. PbS

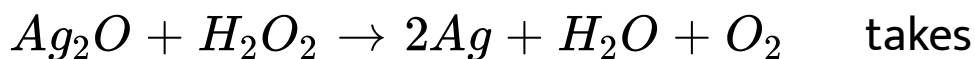
D.  $Na_2SO_3$

**Answer:**



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**18.** The reaction



place in

A. basic medium

B. both in acid and basic medium

C. neutral medium

D. none of the above

**Answer:**



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**19.** Which of the following compounds turns white on treatment with  $H_2O_2$

A. HgS

B. PbS

C. NiS

D. CuS

**Answer:**



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**20.** Hardness of water is due to dissolved impurities of

A. Calcium and magnesium salts

B. Barium and magnesium salts

C. Calcium and strontium salts

D. Sodium and Potassium salts

**Answer:**



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21. When water is dropped over sodium peroxide, the colourless gas produced is:

A. Dinitrogen

B. Dioxygen

C. Dihydrogen

D. Hydrogen peroxide

**Answer:**



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**22.** Which oxide can not be reduced by  $H_2$ ?

A.  $Al_2O_3$

B. CuO

C.  $Ag_2O$

D. All of these

**Answer:**



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**23.** 30 volume hydrogen peroxide means

A. 30%  $H_2O_2$  by volume

B. 30 g of  $H_2O_2$  solution contains 1g of

$H_2O - 2$

C.  $1\text{cm}^3$  of solution liberates  $30\text{cm}^3$  of dioxygen gas at S.T.P

D.  $30\text{cm}^3$  of the solution contains one mole of  $\text{H}_2\text{O}_2$

**Answer:**

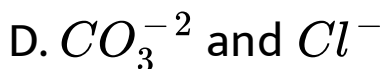
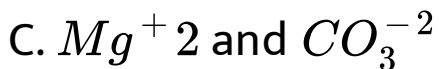
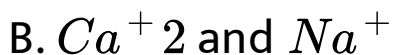
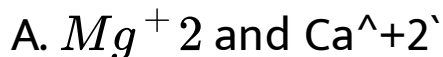


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**24.** When sample of hard water is passed through the layer of sodium zeolite which of



the following ions will not be present in resulting sample of water obtained?

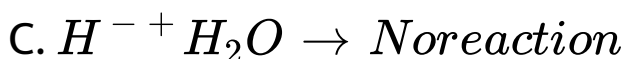
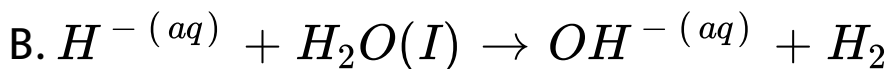
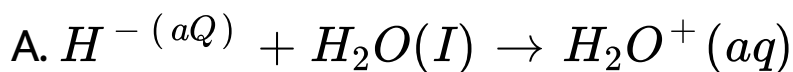


**Answer:**



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25. The hydride  $H^-$  is stronger base than hydroxide ion. Which of the following reaction would occur if NaH is dissolved in water



D. None of these

**Answer:**



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26. The volume strength of  $1.5NH_2O_2$  solution is

A. 4.8

B. 5.2

C. 8.8

D. 8.4

**Answer:**



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27. Which of the following pair of substance will not evolve  $H_2$  gas

A. iron and aqueous  $H_2SO_4$

B. Copper and  $HCl(aq)$

C. Sodium and ethanol

D. iron and steam

**Answer:**



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28. Dihydrogen gas may be prepared by heating caustic soda on

A. Cu

B. Zn

C. Na

D. Ag

**Answer:**



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29. Out of  $H_2SO_4$ ,  $H_2S$ ,  $H_2Se$  and  $H_2Te$  the one with the highest boiling point is:

A.  $H_2O$  because of hydrogen bonding

B.  $H_2Te$  because of higher molecular weight

C.  $H_2S$  because of hydrogen bonding

D.  $H_2Se$  because of lower molecular weight

**Answer:**



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30. Water can not act as

- A. oxidant
- B. Hydrolytic agent
- C. Hydrogenating agent
- D. Reductant

**Answer:**



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31. Commercial  $H_2O_2$  is:

A. 20% by Mass in aqueous solution

B. 25% by mass in aqueous solution

C. 30% by mass in aqueous solution

D. An aqueous solution of  $H_2O_2$

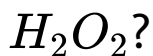
**Answer:**



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32. Which of the following is not true about



A. It is used as a bleaching agent

B. it is used as a rocket fuel

C. it is used in the manufacture of heavy  
water

D. it is used as a mild antiseptic

**Answer:**



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**33.** Justify the position of hydrogen in the periodic table on the basis of its electronic configuration.



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**34.** Give chemical reaction of dihydrogen with

A. Ca

B.  $Cl^2$

C. CO

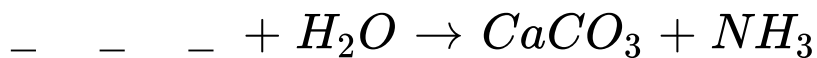
D. C

**Answer:**



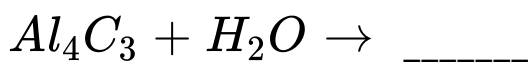
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**35.** Complete the following chemical equations.



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**36.** Complete the following chemical equations.



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**37.** Arrange the following:

$CaH_2$ ,  $BeH_2$  and  $TiH_2$  in order of increasing electrical conductance.



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**38.** Arrange the following:

LiH, NaH and CsH in order of increasing ionic character.



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**39.** H-H, D-D and F-F in order of increasing bond dissociation enthalpy.



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40.  $NaH$ ,  $MgH_2$  and  $H_2O$  in order of increasing reducing property.



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41. What is syngas? Give its uses.



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42. Explain why dihedral angle ( $111.5^\circ$ ) of  $H_2O_2$  crystal reduces to  $90.2^\circ$  in the solid

state?



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**43.** What do you mean by permutit? Mention its uses.



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**44.** How does  $H_2O_2$  help in restoration of old lead paintings?



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**45.** Ionic hydrides are frequently used to remove traces of water from organic compounds. What is the underlying basis of this process?



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**46.** The process  $\frac{1}{2}H_2(g) + e \rightarrow H(g)$  is endothermic with  $\Delta H = +151 \text{ KJ/mol}$ . yet salt



like hydrides are known. How do you account for this?



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**47.** What is the difference between hydrolysis and hydration?



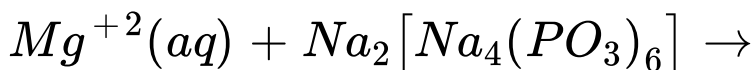
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**48.** Explain how calgon is used to remove permanent hardness.



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49. Complete the following equations.



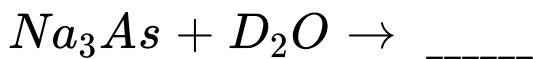
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50. Complete the following equations.



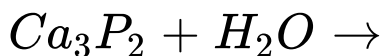
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51. Complete the following equations.



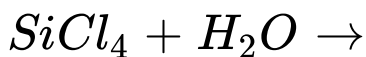
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52. Complete the following given equation:



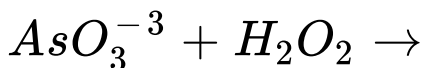
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53. Complete the following given equation:



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54. Complete the following given equation:



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55. Hydrogen forms compounds by 3 different process describe each of the process using suitable examples of reactions.



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56. The degree of hardness of a given sample of hard water is 40 ppm if the entire hardness is due to  $MgSO_4$  how much of  $MgSO_4$  is present per kg of water?



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57. Calculate the strength of 10 volume solution of hydrogen peroxide.



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58. Can phosphorus with outer electronic configuration  $3s^2 3p^3$  form  $PH_5$ ?



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59. What is "water gas shift"? How is  $CO_2$  removed from the mixture?



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60. 5 ml solution of  $H_2O_2$  liberates 0.508 g iodine from an acidified KI solution. Calculate the strength of  $H_2O_2$  solution in terms of volume strength at STP.



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**61.** Give one chemical reaction in each case to show

hydrolytic behaviour of water



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**62.** Give one chemical reaction in each case to show

reducing nature of water



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**63.** Give one chemical reaction in each case to show oxidising behaviour of water



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**64.** Give one chemical reaction in each case to show formation of hydrates



**Watch Video Solution**

**65.** Give one chemical reaction in each case to show

Amphoteric nature of water



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**66.** Write the equation for  $H_2O_2$  having the following properties

Oxidising action in acidic medium



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67. Write the equation for  $H_2O_2$  having the following properties

Reducing action in acidic medium



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68. Write the equation for  $H_2O_2$  having the following properties

Oxidising action in basic medium



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69. Write the equation for  $H_2O_2$  having the following properties

Reducing action in basic medium



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70. Give one use of  $H_2O_2$



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71. Answer the following questions in brief

Compare the structures of  $H_2O$  and  $H_2O_2$



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**72.** How does heavy water react with

Sodium



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**73.** How does heavy water react with

sulphur trioxide



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74. How does heavy water react with  
Magnesium nitride



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75. How does heavy water react with  
 $CHCl_3$



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76. Although  $D_2O$  resembles structurally with  $H_2O$  yet it is more toxic than  $H_2O$  explain



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77. What do you understand by hard water?  
what is temporary and permanent hardness?  
explain ion exchange and synthetic resin  
method of removing permanent hardness.



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