



## CHEMISTRY

### BOOKS - GRB CHEMISTRY (HINGLISH)

### HYDROGEN AND ITS COMPOUNDS

#### Straight Objective Type

1. The sum of the number of neutrons and proton in the isotope of hydrogen is

- A. 3
- B. 4
- C. 5
- D. 6

**Answer: A**



[Watch Video Solution](#)

2. The catalyst used in Bosch process for manufacture of  $H_2$  O is :

A. finely divided Ni

B.  $V_2O_5$

C. Pb

D.  $Fe_2O_3Cr_2O_3$

**Answer: D**



[View Text Solution](#)

3. The most abundant isotope of hydrogen is :

A. tritium

B. deuterium

C. protium

D. para hydrogen

**Answer: C**



[Watch Video Solution](#)

4. The n/p ratio for  ${}_1H^1$  is :

A. 1

B. 2

C. 3

D. Zero

**Answer: D**



[Watch Video Solution](#)

5. Ordinary hydrogen at high temperature is a mixture of :

A. 75% o-Hydrogen+25% p-Hydrogen

B. 25% o-Hydrogen+75% p-Hydrogen

C. 50% o-Hydrogen +50% p-Hydrogen

D. 1% o-Hydrogen+99% p-Hydrogen

**Answer: A**

 [Watch Video Solution](#)

**6. Hydrogen is :**

A. electropositive

B. electronegative

C. both electropositive as well as electronegative

D. neither electropositive nor electronegative

**Answer: C**

 [Watch Video Solution](#)

7. At high temperature, para hydrogen is :

- A. less stable than ortho hydrogen
- B. more stable than ortho hydrogen
- C. as stable as ortho hydrogen
- D. none of the above

**Answer: A**



[Watch Video Solution](#)

8. When the same amount of zinc is treated separately with excess of sulphuric acid and excess of sodium hydroxide, the ratio of volume of hydrogen evolved is

- A. 1 : 1
- B. 1 : 2

C. 2:1

D. 9:4

**Answer: A**



[Watch Video Solution](#)

9. Which is the lightest gas ?

A. nitrogen

B. helium

C. oxygen

D. hydrogen

**Answer: D**



[Watch Video Solution](#)

10. The ratio of electron, proton and neutron in tritium is :

A. 1 : 1 : 1

B. 1 : 1 : 2

C. 2 : 1 : 1

D. 1 : 2 : 1

**Answer: B**



[Watch Video Solution](#)

11. The nuclei of tritium ( $H^3$ ) atom would contain neutrons :

A. 1

B. 2

C. 3

D. 4

**Answer: B**



[Watch Video Solution](#)

**12.** The adsorption of hydrogen by metals is called :

A. dehydrogenation

B. hydrogenation

C. occlusion

D. adsorption

**Answer: C**



[Watch Video Solution](#)

**13.** At absolute zero :

A. only para hydrogen exists



- B. only ortho hydrogen exists
- C. both para and ortho hydrogen exist
- D. none of the above

**Answer: A**

 [Watch Video Solution](#)

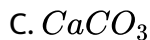
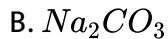
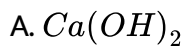
**14.** Only temporary hardness in water is removed by :

- A. boiling
- B. filtration
- C. Calgon's process
- D. none of these

**Answer: A**

 [Watch Video Solution](#)

15. Both temporary and permanent hardness is removed on boiling with

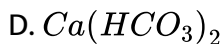
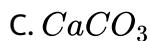
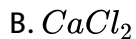


**Answer: B**



**Watch Video Solution**

16. Temporary hardness of water is caused due to the presence of



**Answer: D**



[Watch Video Solution](#)

**17.** High boiling point of water is due to :

- A. its high specific heat
- B. hydrogen bonding
- C. high dielectric constant
- D. low dissociation constant

**Answer: B**



[Watch Video Solution](#)

**18.** Calgon is an industrial name given to

- A. normal sodium phosphate

- B. sodium meta-aluminate
- C. sodium hexametaphosphate
- D. hydrated sodium aluminium silicate

**Answer: C**

 [Watch Video Solution](#)

**19. Permutit is :**

- A. hydrated sodium aluminium silicate
- B. sodium hexametaphosphate
- C. sodium silicate
- D. sodium meta-aluminate

**Answer: A**

 [Watch Video Solution](#)

20. Heavy water is used in atomic reactor as

- A. coolant
- B. moderator
- C. both coolant and moderator
- D. neither coolant nor moderator

**Answer: C**



[Watch Video Solution](#)

21. Calgon (a water softener) is :

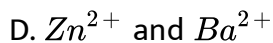
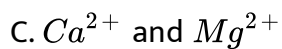
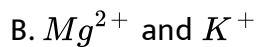
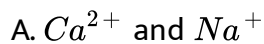
- A.  $Na_2[Na_4(PO_3)_6]$
- B.  $Na[Na_2(PO_3)]_6$
- C.  $Na_2[Na_4(PO_4)_6]$
- D.  $Na_4[Na_2(PO_4)_6]$

**Answer: A**



**Watch Video Solution**

**22.** The hardness of water is due to.....metal ions.

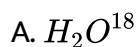


**Answer: C**



**Watch Video Solution**

**23.** The formula of heavy water is :



B.  $D_2O$

C.  $T_2O$

D.  $H_2O^{17}$

**Answer: B**

 [Watch Video Solution](#)

**24.** Pure de-mineralised water can be obtained by :

A.  $Na^+$  cation exchanger and  $Cl^-$  anion exchanger

B.  $H^+$  cation exchanger only

C.  $H^+$  cation exchanger and  $OH^-$  anion exchanger

D.  $Na^+$  cation exchanger only

**Answer: C**

 [Watch Video Solution](#)

25. The bleaching of  $H_2O_2$  are due to its :

- A. reducing properties
- B. oxidising properties
- C. unstable nature
- D. acidic nature

**Answer: B**



[Watch Video Solution](#)

26. Hydrogen peroxide has a:

- A. linear structure
- B. pyramidal structure
- C. closed book type structure
- D. half open book type structure



**Answer: D**

 [Watch Video Solution](#)

**27.** Hydrogen peroxide is a:

A. liquid

B. gas

C. solid

D. semi-solid

**Answer: A**

 [Watch Video Solution](#)

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

A. 

B. 

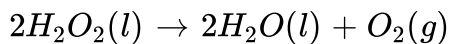
C. 

D. 

**Answer: B**

 [View Text Solution](#)

**29.** Decomposition of  $H_2O_2$  is retarded by :



A. acetanilide

B.  $MnO_2$

C. zinc

D. finely divided metals

**Answer: A**

 [Watch Video Solution](#)

30.  $H_2O_2$  is :

- A. an oxidising agent
- B. both oxidising and reducing agent
- C. reducing agent
- D. none of the above

**Answer: B**



[Watch Video Solution](#)

31.  $H_2O_2$  is always stored in black bottles because

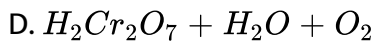
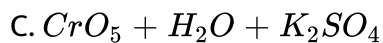
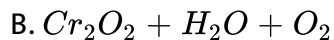
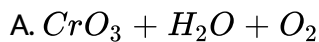
- A. it is highly unstable
- B. its enthalpy of decomposition is high
- C. it undergoes auto-oxidation on prolonged standing in light
- D. none of the above

**Answer: C**



**Watch Video Solution**

**32.** Acidified solution of  $K_2Cr_2O_7$  on treatment with  $H_2O_2$  yields :



**Answer: C**



**Watch Video Solution**

**33.**  $H_2O_2$  restores the colour of old lead paintings, blackened by the action of  $H_2S$  gas by :

- A. converting  $PbO_2$  to Pb
- B. by oxidising PbS to  $PbSO_4$
- C. converting  $PbCO_3$  to Pb
- D. oxidising  $PbSO_3$  to  $PbSO_4$

**Answer: B**

 [Watch Video Solution](#)

**34.** The reaction of  $H_2S + H_2O_2 \rightarrow S + 2H_2O$  manifests

- A. acidic nature of  $H_2O_2$
- B. alkaline nature of  $H_2O_2$
- C. oxidising nature of  $H_2O_2$
- D. reducing nature of  $H_2O_2$

**Answer: C**

 [Watch Video Solution](#)

35. Hydrogen peroxide is now generally prepared on industrial scale by the

- A. action of  $H_2SO_4$  on barium peroxide
- B. action of  $H_2SO_4$  on sodium peroxide
- C. electrolysis of 50%  $H_2SO_4$
- D. burning hydrogen in excess of oxygen

**Answer: C**



**Watch Video Solution**

36. The gas(es) used in the hydrogenation of oils in presence of nickel as a catalyst is/are:

- A. methane
- B. ethane

C. ozone

D. hydrogen

**Answer: D**



[Watch Video Solution](#)

**37. Which of the following produces hydrolith with dihydrogen ?**

A. Mg

B. Al

C. Cu

D. Ca

**Answer: D**



[Watch Video Solution](#)

38. Which process is/are used to remove permanent hardness ?

- A. Boiling
- B. Clark's method
- C. On reaction with NaOH
- D. Permutit process

**Answer: D**



**Watch Video Solution**

39. Ionic hydrides is/are usually :

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



**Answer: C**



**Watch Video Solution**

**40.** Ortho-hydrogen and para-hydrogen resembles in which of the following property ?

- A. Thermal conductivity
- B. Magnetic properties
- C. Chemical properties
- D. Heat capacity

**Answer: C**



**Watch Video Solution**

**41.** Ionic hydrides are formed by :

- A. transition metals
- B. elements of very high electropositivity
- C. elements of very low electropositivity
- D. metalloids

**Answer: B**

 [Watch Video Solution](#)

**42. Which hydride is/are an ionic hydride ?**

- A.  $NH_3$
- B.  $H_2S$
- C.  $TiH_{1.73}$
- D.  $NaH$

**Answer: D**

 [Watch Video Solution](#)

43. Which of the following hydride is/are "electron-precise" type ?

A. HF

B.  $H_2O$

C.  $SiH_4$

D.  $PH_3$

Answer: C



Watch Video Solution

44. Which will produce hard water ?

A. Saturation of water with  $CaSO_4$

B. Addition of  $Na_2SO_4$  of water

C. Saturation of water with  $CaCO_3$

D. Saturation of water with  $MgCO_3$

**Answer: A**

 [Watch Video Solution](#)

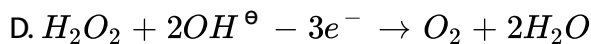
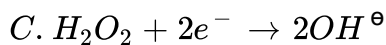
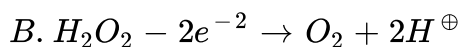
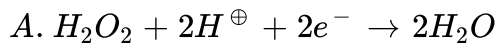
45. Very pure hydrogen (99.9 %) can be made by which of the following processes ?

- A. Reaction of salt like hydrides with water
- B. Reaction of methane with steam
- C. Mixing natural hydrocarbons of high molecular weight
- D. Electrolysis of water

**Answer: D**

 [Watch Video Solution](#)

46. In which of the following reaction  $H_2O_2$  acts as a reducing agents?



A. P, R

B. Q, S

C. P, Q

D. R, S

**Answer: B**



**Watch Video Solution**

47. Which of the following statements about  $Na_2O_2$  is not correct ?

A.  $Na_2O_2$  oxidises  $Cr^{3+}$  to  $CrO_4^{2-}$  in acid medium

B. It is diamagnetic in nature

C. It is the super oxide of sodium

D. It is a derivative of  $H_2O_2$

**Answer: C**

 [View Text Solution](#)

**48.** Hydrogen peroxide acts both as an oxidising and as a reducing agent depending upon the nature of the reacting species. In which of the following cases  $H_2O_2$  acts as a reducing agent in acid medium ?

A.  $MnO_4^-$

B.  $SO_3^{2-}$

C.  $KI$

D.  $Cr_2O_7^{2-}$

**Answer: A,B**



[Watch Video Solution](#)

49. Permanent hardness in water cannot be cured by :

- A. treatment with washing soda
- B. Calgon's method
- C. boiling
- D. ion exchange method

**Answer: C**



[Watch Video Solution](#)

50. From the following statements regarding  $H_2O_2$ , choose the incorrect statements:

- A. it has to be stored in plastic or wax lined glass bottles in dark
- B. it has to kept away from dust

C. it can act only as an oxidizing agent

D. it decomposes on exposure to light

**Answer: C**

 [Watch Video Solution](#)

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

A.  $H^+$  ions

B.  $Ca^{2+}$  ions

C.  $SO_4^{2-}$  ions

D.  $OH^-$  ions

**Answer: B**

 [Watch Video Solution](#)



52. Which of the following statement is correct ?

- A. Hydrogen has same ionisation potential as sodium
- B. H has same electronegativity as halogens
- C. It will not be liberated at anode
- D. H has oxidation state +1, zero and -1

**Answer: D**



[Watch Video Solution](#)

53. Polyphosphates are used for softening agents because they

- A. form soluble complexes with anionic species
- B. precipitate anionic species
- C. form soluble complexes with cationic species
- D. precipitate cationic species

**Answer: C**

 [Watch Video Solution](#)

54. Hydrogen peroxide in its reaction with  $KIO_4$  and  $NH_2OH$  respectively, is acting as a

- A. reducing agent, oxidising agent
- B. reducing agent, reducing agent
- C. oxidising agent, oxidising agent
- D. oxidising agent, reducing agent

**Answer: A**

 [Watch Video Solution](#)

55. Which is correct about the reaction between  $H_2O_2$  and  $O_3$ ?

- A. It is a case of mutual reduction
- B.  $O_3$  will oxidise  $H_2O_2$  into  $O_2$
- C. It is not a redox reaction
- D.  $H_2O_2$  being a stronger oxidising agent will decompose ozone into oxygen

**Answer: B**



**Watch Video Solution**

**56.** Which physical property of dihydrogen is wrong?

- A. Tasteless gas
- B. Odourless gas
- C. Non-inflammable gas
- D. Colourless gas

**Answer: C**



Watch Video Solution

57. An element having electronic configuration  $1s^2 2s^2 2p^6 3s^1$  will form:

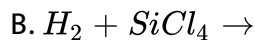
- A. acidic oxide
- B. basic oxide
- C. amphoteric oxide
- D. neutral oxide

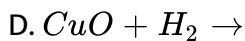
Answer: B



Watch Video Solution

58. In which of the following reactions does hydrogen act as an oxidising agent ?

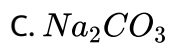
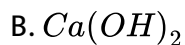
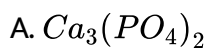




**Answer: C**

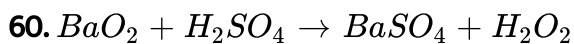
 [Watch Video Solution](#)

59. The reagent(s) used for softening the temporary hardness of water is (are):



**Answer: B**

 [Watch Video Solution](#)



In the above method of preparation of  $H_2O_2$ , now-a-days  $H_3PO_4$ (conc.) is used instead of conc.  $H_2SO_4$  because :

- A.  $H_2SO_4$  catalyses the backward reaction
- B.  $H_2SO_4$  catalyses the decomposition of  $H_2O_2$
- C.  $H_3PO_4$  catalyses the backward reaction
- D. none of the above

**Answer: B**



[Watch Video Solution](#)

61. The treatment of alkali ( $NaOH$ ) with beryllium hydroxide causes geometrical change of product from :

- A. linear to trigonal planar
- B. linear to tetrahedral

C. trigonal planar to tetrahedral

D. linear to octahedral

**Answer: B**

 [Watch Video Solution](#)

62. In aqueous solution, the largest ion is :

A.  $Na^+$  (aq)

B.  $Cs^+$  (aq)

C.  $Rb^+$  (aq)

D.  $Li^+$  (aq)

**Answer: D**

 [Watch Video Solution](#)

63. Which metal reacts most vigorously with water ?

A. Al

B. Ca

C. Fe

D. K

Answer: D



Watch Video Solution

64. A dilute solution of which acid is most likely to produce a reduction product other than  $H_2$  when it reacts with a metal ?

A. HF

B. HCl

C.  $HNO_3$

D.  $H_2SO_4$



**Answer: C**



[View Text Solution](#)

**65.** Which transformation demonstrates that the bonds between water molecules are weaker than the bonds within a water molecule ?

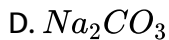
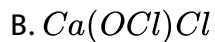
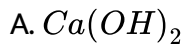
- A. Freezing water
- B. Electrolysis water
- C. Boiling water
- D. Reaction of water with Na(s)

**Answer: C**



[View Text Solution](#)

**66.** Permanent hardness due to  $Mg^{2+}$  ions is best removed by



**Answer: D**

 [Watch Video Solution](#)

### Multiple Objective Type

1. Which of the following is/are same for ortho and para hydrogen ?

A. In the number of protons

B. In the molecules mass

C. In the nature of spins of nucleus

D. In the nature of spins of electrons

**Answer: A::B::D**



**Watch Video Solution**

2. In Bosch's process, which gas is utilised for the production of hydrogen gas

A. Producer gas

B. Water gas

C. Coal gas

D. Natural gas

**Answer: A::C::D**



**Watch Video Solution**

3. Water softening by Clarke's process uses

- A. calcium bicarbonate
- B. sodium bicarbonate
- C. potash alum
- D. calcium hydroxide

**Answer: A::B::C**

 [Watch Video Solution](#)

**4. Which of the following will produce hydrogen gas ?**

- A. Reaction between Fe and dil. HCl
- B. Reaction between Zn and conc.  $H_2SO_4$
- C. Reaction between Zn and  $NaOH$
- D. Electrolysis of  $NaCl$  (aq) Nelson's cell

**Answer: A::C::D**

 [Watch Video Solution](#)

5. Which of the following statements concerning protium, deuterium and tritium is not true ?

- A. They are isotopes of each other
- B. They have similar electronic configurations
- C. They exist in the nature in the ratio of 1 : 2 : 3
- D. Their mass numbers are in the ratio of 1 : 2 : 3

**Answer: A::B::D**



**Watch Video Solution**

6. Which of the following statements is/are correct ?

- A. Atomic hydrogen is obtained by passing hydrogen gas through an electric arc
- B. 30% (w/v) or 100V  $H_2O_2$  solution is called perhydrol

C. Finely divided palladium adsorbs large volume of hydrogen gas

D. Ortho and para hydrogen have same physical properties

**Answer: A::B::C**

 [Watch Video Solution](#)

7. Hydrogen peroxide can act as:

A. a reducing agent

B. an oxidising agent

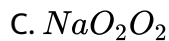
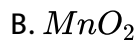
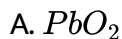
C. a dehydrating agent

D. a bleaching agent

**Answer: A::B::D**

 [Watch Video Solution](#)

8. The oxide that gives  $H_2O_2$  on treatment with a dilute acid is

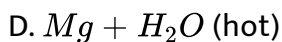
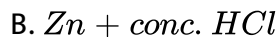
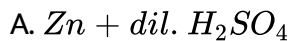


Answer: C::D



Watch Video Solution

9. Hydrogen can be obtained by :



Answer: A::B::D



Watch Video Solution

## Comprehension Type

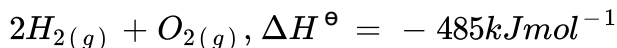
1. Hydrogen accounts for approximately 75 % of the mass of the universe.

Hydrogen serves as the nuclear fuel of our Sun and other stars, and these are mainly composed of hydrogen. On the earth, though hydrogen is rarely found in the uncombined state. Since the earth's gravity is too weak to hold such light molecules, nearly all the  $H_2$  originally present in the earth's atmosphere has been lost to space. In the earth's crust and oceans, hydrogen is found in water, petroleum, proteins, carbohydrates and other compounds and it is the ninth most abundant element on a mass basis. Hydrogen has three isotopes : hydrogen or protium ( $^1H$ ), deuterium or heavy hydrogen ( $D$  or  $^2H$ ), tritium ( $T$  or  $^3H$ ). The physical properties of the three isotopes are different due to the difference in their masses, i.e. isotope effect. The chemical properties of the three



isotopes are similar as they have the same electronic configuration.

Reaction between hydrogen and oxygen is highly exothermic, and gas mixtures that contain as little as 4% by volume hydrogen in oxygen (or in air) are highly flammable and potentially explosive.



As hydrogen is environmentally clean it is an enormously attractive fuel.

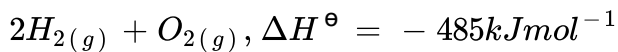
'Hydrogen economy' is an emerging field in which it is thought that our energy needs can be met by gaseous, liquid and solid hydrogen. As hydrogen is not a naturally occurring substance such as coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used.

Which of the following is radioactive in nature?

- A. Hydrogen only
- B. Deuterium only
- C. Tritium only
- D. Deuterium and tritium

**Answer: C**

2. Hydrogen accounts for approximately 75% of the mass of the universe. Hydrogen serves as the nuclear fuel of our Sun and other stars, and these are mainly composed of hydrogen. On the earth, though hydrogen is rarely found in the uncombined state. Since the earth's gravity is too weak to hold such light molecules, nearly all the  $H_2$  originally present in the earth's atmosphere has been lost to space. In the earth's crust and oceans, hydrogen is found in water, petroleum, proteins, carbohydrates and other compounds and it is the ninth most abundant element on a mass basis. Hydrogen has three isotopes : hydrogen or protium ( $^1H$ ), deuterium or heavy hydrogen (D or  $^2H$ ), tritium ( $T$  or  $^3H$ ). The physical properties of the three isotopes are different due to the difference in their masses, i.e. isotope effect. The chemical properties of the three isotopes are similar as they have the same electronic configuration. Reaction between hydrogen and oxygen is highly exothermic, and gas mixtures that contain as little as 4% by volume hydrogen in oxygen (or in air) are highly flammable and potentially explosive.



As hydrogen is environmentally clean it is an enormously attractive fuel.

'Hydrogen economy' is an emerging field in which it is thought that our energy needs can be met by gaseous, liquid and solid hydrogen. As hydrogen is not a naturally occurring substance such as coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used.

Hydrogen,  $H_2$  is very less abundant in the atmosphere due to

- A. inflammable nature of  $H_2$
- B. weak earth's gravity which is not able to hold light  $H_2$  molecules
- C. diatomic nature of hydrogen
- D. very rapid reaction between hydrogen and atmospheric oxygen

**Answer: B**



[Watch Video Solution](#)

3. Hydrogen accounts for approximately 75% of the mass of the universe. Hydrogen serves as the nuclear fuel of our Sun and other stars, and these are mainly composed of hydrogen. On the earth, though hydrogen is rarely found in the uncombined state. Since the earth's gravity is too weak to hold such light molecules, nearly all the  $H_2$  originally present in the earth's atmosphere has been lost to space. In the earth's crust and oceans, hydrogen is found in water, petroleum, proteins, carbohydrates and other compounds and it is the ninth most abundant element on a mass basis. Hydrogen has three isotopes : hydrogen or protium ( $^1H$ ), deuterium or heavy hydrogen (D or  $^2H$ ), tritium ( $T$  or  $^3H$ ). The physical properties of the three isotopes are different due to the difference in their masses, i.e. isotope effect. The chemical properties of the three isotopes are similar as they have the same electronic configuration. Reaction between hydrogen and oxygen is highly exothermic, and gas mixtures that contain as little as 4% by volume hydrogen in oxygen (or in air) are highly flammable and potentially explosive.



As hydrogen is environmentally clean it is an enormously attractive fuel. 'Hydrogen economy' is an emerging field in which it is thought that our energy needs can be met by gaseous, liquid and solid hydrogen. As hydrogen is not a naturally occurring substance such as coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used.

Liquid  $H_2$  has been used as rocket fuel as

- A. its reaction with oxygen is highly exothermic
- B. it occupies small space
- C. it has high thrust
- D. all of the above

**Answer: D**



[Watch Video Solution](#)

**Match The Column Type**

1. 



[View Text Solution](#)

2. 



[View Text Solution](#)

## Subjective Type

1. What is the sum of protons, electrons and neutrons in the heaviest isotope of hydrogen?



[Watch Video Solution](#)

2. Find out the number of following orders which are correct against the mentioned properties:

(a)  $H_2 < D_2 < T_2$  (Number of protons)

(b)  $H_2 < D_2$  (Bonding energy)

(c)  $H_2 < D_2 < T_2$  (Boiling point)

(d)  $H_2 < D_2 < T_2$  (Number of neutrons)

 [Watch Video Solution](#)

3. Find out the number of following orders which are not correct against the mentioned properties:

(a)  $CaH_2 < BeH_2$  (Electrical conductance in molten condition)

(b)  $LiH < NaH < CsH$  (Ionic character)

(c)  $H_2 < D_2 < F_2$  (Bond dissociation enthalpy)

(d)  $NaH < MgH_2 < H_2O$  (Reducing property)

 [Watch Video Solution](#)

4. The oxidation state of oxygen of  $H_2O_2$  in the final products when it reacts with  $ClO_3^\ominus$  is

 [Watch Video Solution](#)

5. Find out the value of x in ion  $[H_xO_4]^+$ .

 [Watch Video Solution](#)

6. Total number of reagents which do not oxidize water into oxygen:

$H_2O_2$ ,  $F_2$ ,  $FeCl_3$ ,  $I_2$ ,  $K_2Cr_2O_7$

 [Watch Video Solution](#)

7. Choose total number of correct statements about  $H_2O_2$  :

- (a) in the pure state,  $H_2O_2$  is almost colourless (very pale blue)
- (b) hydrogen peroxide has non-planar structure in both gas phase and solid phase
- (c) 2-ethylanthraquinol react with water to give  $H_2O_2$
- (d)  $H_2O_2$  is used in pollution control
- (e) dihedral angle of  $H_2O_2$  is larger in gas phase compared to that in solid phase

 [Watch Video Solution](#)



8. Total number of methods which can remove permanent hardness of water:

(a) Clark's method , (b) Ion-exchange method

(c) synthetic resin method

(d) Calgon method

(e) treatment with sodium carbonate



Watch Video Solution