



CHEMISTRY

BOOKS - S DINESH & CO CHEMISTRY (HINGLISH)

HYDROGEN

Multiple Choice Questions

1. Hydrogen from HCl can be prepared by

A. Mg

B. Cu

C. P

D. Pt.

Answer: A



2. Which of the following can adsorb largest volume of hydrogen gas ?

A. Finely divided platinum

B. Finely divided nikel

C. Colloidal palladium

D. Colloidal platinum.

Answer: C

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

A. 1

B. 2

C. 3

Answer: B



4. The colour of hydrogen is

A. Black

B. Yellow

C. Orange

D. Colourless.

Answer: D



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

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6. Hydrogen cannot reduce

A. Hot CuO

B. Hot Fe_2O_3

C. Hot SnO_2

D. Hot Al_2O_3 .

Answer: D



7. Hydrogen does not combine with

A. Antimony

B. Sodium

C. Bismuth

D. Helium.

Answer: D

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8. The adsorption of hydrogen by metals is called :

A. Dehydrogenation

B. Hydrogenation

C. Occulsion

D. Adsorption.

Answer: C



9. Which of the following produces hydrolith with dihydrogen?

A. Mg

B. Al

C. Cu

D. Ca.

Answer: D



10. The metal which displaces hydrogen from a boiling caustic soda solution is :

A. As

B. Zn

C. Mg

D. Fe.

Answer: B

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11. Hydrogen is evolved the action of cold dilute HNO_3 on :

A. Fe

B. Mg

C. Cu

D. Al.

Answer: B



12. Metals like platinum and palladium can adsorb large volumes of hydrogen under special conditions. Such adsorbed hydrogen by the metal is known as

A. Adsorbed hydrogen

B. Occluded hydrogen

C. Reactive hydrogen

D. Atomic hydrogen.

Answer: B



13. Which is poorest reducing agent?

A. Nascent hydrogen

B. Atomic hydrogen

C. Dihydrogen

D. All have same reducing strength

Answer: C

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

A. 6

B. 5

C. 4

D. 3

Answer: C

15. Number of nucleons in D_2 molecule is



Answer: D

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16. An ionic compounds is dissolved simultaneously in heavy water simple

water. Its solubility is

A. Larger in heavy water

B. Smaller in heavy water

- C. Solubility is same in both
- D. Smaller in simple water.

Answer: B

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17. 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

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18. The difference between heat of adsorption of ortho and para hydrogen is

A. $0\cdot 4kJmol^{-1}$

 $B.0 \cdot 8kJmol^{-1}$

C. Zero

D. None.

Answer: A

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19. Hydrogen ion H^{-} is isoelectronic with

A. Li

B. He

 $\mathsf{C.}\,H^{\,+}$

D. Li^{-}

Answer: B

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20. The ionization constant for acetic acid is

A. Three times larger than deuteric acid

B. One-third of of the deuteric acid

C. Equal to deuteric acid

D. Two times larger than deuteric acid.

Answer: A

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21. Hydrogen can be prepared by mixing steam and water gas at 500° C in the presence of Fe_3O_4 and Cr_2O_3 . This process is called

A. Nelson process

B. Serpeck's process

C. Bosch process

D. Parke's process.

Answer: C

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22. Which of the following metals do not liberate hydrogen from dilute hydrochloric acid ?

A. Zn

 $\mathsf{B}.\,Mg$

 $\mathsf{C}.\,Fe$

D. Au

Answer: D



23. 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 in Nalson's cell.

Answer: B

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24. An element reacts with hydrogen to form a compound A which on treatment with water liberates hydrogen gas. The element can be

A. Nitrogen

B. Chlorine

C. Selenium

D. Calcium.

Answer: D

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25. Hydrogen combines with other elements by

A. losing an electron

B. gaining an electron

C. Sharing an electron

D. losing, gaining or sharing electron

Answer: D

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26. Which of the following explanation is best for not placing hydrogen with alkali metals or halogen ?

A. The ionization energy of hydrogen is high for group of alkali metals

or halogen

B. Hydrogen can form compounds

C. Hydrogen is much lighter element than the alkali metals or

halogens

D. Hydrogen atoms does not contain any neutron.

Answer: C

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27. Which of the following terms is not correct for hydrogen ?

A. Its molecule is diatomic

B. It exists both as H^+ and H^- in different chemical compounds

C. It is the only species which has no neutrons in the nucleus

D. Heavy water is unstable because hydrogen is substituted by its

isotope deuterium.

Answer: D

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28. When a molten ionic hydride is electrolysed.

A. hydrogen is liberated at the anode

B. hydrogen is liberated at the cathode

C. no reaction takes place

D. hydride ion migrates towards cathode

Answer: A

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29. Which of the halogen has maximum affinity for hydrogen ?

A. F_2

 $\mathsf{B.}\,Cl_2$

 $\mathsf{C}.\,Br_2$

 $\mathsf{D}.\,I_2.$

Answer: A

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30. Which of the following statements is most applicable to hydrogen ?

A. It can act as a reducing agent

B. It can act as an oxidising agent

C. It can act both as oxidising and reducing agent

D. It can neither act as oxidising nor as a reducing agent.

Answer: C



31. The isotope of hydrogen which is radioactive is

A. Tritium

B. Deuterium

C. Para hydrogen

D. Nascent hydrogen.

Answer: A

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32. $TiH_{1.73}$ is an example of

A. Ionic hydride

B. Covalent hydride

C. Metallic hydride

D. Polymeric hydride.

Answer: C

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33. Hydrogen is :

A. electropositive

B. electronegative

C. both electropositive as well as electronegative

D. neither electropositive nor electronegative.

Answer: C

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34. Which one of the following properties shows that hydrogen resembles alkali metals ?

A. It shown metallic character like alkali metals

B. It is diatomic like alkali metals

C. Its ionisation energy is of the same order as that of alkali metals

D. When hydrogen halides and alkali metals halides are electrolysed,

hydrogen and alkali metals are liberated at the cathode.

Answer: D

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35. Ionization energy of hydrogen is

A. equal to that of chlorine

B. lesser than that of chlorine

C. slightly higher than that of chlorine

D. much higher than that of chlorine.

Answer: C



36. Hydrogen acts as a reducing agent and thus resembles

A. Halogen

B. Noble gases

C. Radioactive elements

D. Alkali metals.

Answer: D



37. Which position for hydrogen explain all its properties ?

A. At the top of halogen

B. At the top of alkali metals

C. At the top of carbon family

D. None of these.

Answer: D

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38. Hydrogen readily combines with non - metals and thus it shows its

A. electronegativity character

B. electropositive character

C. Both (A) and (B)

D. None of these.

Answer: B



39. The oxidation states shown by hydrogen are

A. - 1 only

B. zero only

C. +1, -1, 0

 $\mathsf{D.}+1 \mathsf{ only}$

Answer: C

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40. Hydrogen readily combines with metals and thus show its

A. electropositive character

B. electronegative character

C. Both (A) and (B)

D. None of these

Answer: B



41. Protonic acid is

A. a compound that form solvated hydrogen ion in polar solvent

B. an acid which accepts the proton

C. a compound that forms hydride ion in polar solvent

D. an acid which donates the proton.

Answer: A



42. In all its properties, hydrogen resembles :

A. Alkali metals only

B. Halogen only

C. Both alkali metals and halogens

D. Neither alkali metals nor halogens.

Answer: C

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43. Hydrogen molecule differs from chlorine molecule in the following respect :

A. Hydrogen molecule is non -polar but chlorine molecule is polar

B. Hydrogen molecule is polar while chlorine molecule is non-polar

C. Hydrogen molecule can form intermolecular hydrogen bonds but

chlorine molecule does not

D. Hydrogen molecule cannot participate in coordination bond

fromation but chlorine molecule can

Answer: D

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44. Which of the following statements concerning protium, 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: C



45. When SO_3 is treated with heavy water the products is /are :

A. Deuterium and sulphuric acid

B. Deuterium and sulphurous acid

C. Only Deuterium

D. Dideuterosulphuric acid

Answer: D

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46. Hydrogen has three isotopes, the number of possible diatomic molecules will be

A. 2

B. 6

C. 9

D. 12

Answer: B

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47. In which of the compounds does hydrogen have an oxidation state of

-1 ?

A. CH_4

 $\mathsf{B.}\,NH_3$

 $\mathsf{C}.\,HCl$

 $\mathsf{D.}\, CaH_2.$

Answer: D

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48. Hydrogen acts as an oxidising agent in the reaction with :

A. Bromine

B. Calcium

C. Nitrogen

D. Sulphur.

Answer: B

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49. Pure hydrogen is obtained by carrying electrolysis of

A. water containing H_2SO_4

B. water containing NaOH

C. $Ba(OH)_2$ solution

D. KOH solution

Answer: C

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50. In Bosch's process, which gas is utilized for the production of hydrogen gas

A. Producer gas

B. Water gas

C. Coal gas

D. None

Answer: B

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51. Deuterium differs from hydrogen ?

A. Chemical properties

B. Physical properties

C. Both physical and chemical properties

D. Radioactive properties.

Answer: B

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52. Tritium undergoes radioactive decay giving

A. α – particles

B. β – particles

C. neutrons

D. $\gamma-\mathrm{rays}$

Answer: B

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53. The decay product of tritium is

A. $._1 H^1$ B. $._1 H^2$

 $\mathsf{C.}_2 He^4$

 $\mathsf{D}_{\cdot \cdot 2} \, He^3$

Answer: D

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54. 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



55. The conversion of atomic hydrogen into ordinary hydrogen is

A. Exothermic change

B. Endothermic change

C. Nuclear change

D. Photochemical change

Answer: A



56. Adsorbed hydrogen by Palladium is known as

A. Atomic

B. Nascent

C. Occulded

D. Heavy.

Answer: C

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57. Which is the lightest gas ?

A. Nitrogen

B. Helium

C. Oxygen

D. Hydrogen

Answer: D

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58. Othro and para hydrogens differ in the

A. In the number of protons

B. In the molecular weight

C. In the nature of spins of protons

D. In the nature of spins of electrons.

Answer: B

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59. The name hydrogen was given by

A. Cavendish

B. Lavoisier

C. Urey

D. None

Answer: B



60. The ratio $C_p \,/\, C_v$ for H_2 is

A. $1 \cdot 40$

 $\mathsf{B.1}\cdot 67$

 $\mathsf{C.1}\cdot 33$

D. None.

Answer: A



61. Triatomic hydrogen is called

A. Deuterium

B. Hyzone

C. Ortho form

D. Hydronium ion.

Answer: B

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62. $LiAlH_4$ is obtained by reacting an excess of (x) with an ethereal solution of $AlCl_3$. Then (x) is

A. LiCl

B. LiH

C. Li

D. LiOH.

Answer: B

63. Alkali metal hydrides react with water to give

A. Acidic solution

B. Basic solution

C. Neutral solution

D. Hydride ion

Answer: B

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64. Amongst the alkali metal hydrides, the most stable one is

A. LiH

 $\mathsf{B.}\, NaH$

 $\mathsf{C}.\,KH$

D. RbH

Answer: A



65. Ionic hydrides are usually

A. good electrically conductors when solid

B. easily reduced

C. good reducing agents

D. liquid at room temperature.

Answer: C

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66. When $NaBH_4$ is dissolved in water

A. it decomposes with the evolution of H_2

B. NA^+ and BH_4^- are formed which are stable

C. $BH_4^{\,-}\,$ ions formed initially decompose to produce $OH^{\,-}\,$ ions,

which prevent further decomposition

D. NaH and B_2H_6 are produced.

Answer: C

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67. Systematic name of H_2O is

A. water

B. hydrogen oxide

C. oxidane

D. None of these.

Answer: C

68. Group 2 hydrides with significant covalent character is/are

A. BeH_2

 $\mathsf{B.}\,MgH_2$

C. Both (A) and (B)

D. None.

Answer: C

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69. Limiting compositions of f-block hydrides are

A. MH_2 and MH_3

B. MH_3 and MH_5

C. MH_2 and MH_8

D. MH_2 and MH_6 .

Answer: A

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70. In which of the following characteristics does hydrogen resemble halogens ?

A. Hydrogen is the lighest gas

B. H atoms contains one electron each

C. Hydrogen form ionic hydrides with alkali metals

D. Hydrogen has three isotopes.

Answer: C

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71. In which property listed below hydrogen does not resemble alkali metals ?

A. Tendency to form cation

B. Nature of oxide

C. Combination with halogens

D. Reducing character.

Answer: B

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72. In which of the properties listed below hydrogen does not show

resemblance with halogens ?

I Electropositive character

II Electronegative character

III Neutral nature of H_2O

IV. Atomcity

A. I and III

B. I only

C. II and III

D. III and IV

Answer: A

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73. In which of the following reactions does dihydrogen act as oxidising agent ?

A. $Ca+H_2
ightarrow$

 $\mathsf{B.}\,H_2+O_2\rightarrow$

 $\mathsf{C}.\,H_2+F_2\rightarrow$

D. $CuO+H_2
ightarrow$

Answer: A

74. Which of the following species has highest bond energy ?

A. H_2

 $\mathsf{B}.\,T_2$

 $\mathsf{C}.\,D_2$

 $D. Cl_2.$

Answer: B

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75. Which combination cannot be used for the preparation of hydrogen

gas in the laboratory?

I. Zinc/conc. H_2SO_4

II. Zinc/dil. HNO_3

III. Pure zinc/dil. H_2SO_4

A. I and II

B. I,II,III

C. III only

D. I and III.

Answer: B

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76. Hydrogen molecules are

A. Monoatomic and form X_2^{2-} type ions

B. Diatomic and form X_2^- type ions

C. Diatomic and form X^- as well as X^{-1} type ion

D. Monoatomic and form X type ion.

Answer: C

77. For binary hydrides hydrides of formula MX_n , the value of n can be fractional for

A. salt like hydrides

B. interstitial hydrides

C. covalent hydrides

D. Polymeric hydride.

Answer: B

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78. Hydrides of elements of group 3 to 5 are generally called

A. Interstitial hydrides

B. Ionic hydrides

C. Polymeric hydrides

D. Complex hydrides.

Answer: A



79. Which pair of species can undergo chemical reaction with each other ?

A. CO + NO

B. LiH and H_2O

C. CO_2 and HCl

 $\mathsf{D.}\, CAH_2 + SiH_4.$

Answer: B

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80. Which of the following statements do not define the characteristic

property of water

Water is a universal solvent ?

A. It can dissolve maximum number of compounds

B. It has very low dielectric constant

C. It has high liquid range

D. None of these

Answer: B

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81. The velocity of neutrons in nuclear is slowed down by

A. Heavy water $(D_2 O)$

B. Ordinary water (H_2O)

C. Zinc rod

D. Fused caustic soda.

Answer: A



82. Temporary hardness of water is due the presence of

A. Magnesium bicarbonate

B. Calcium chloride

C. Magnesium sulphate

D. Calcium carbonate.

Answer: A



83. Which of the following is not true?

A. Hardness of water depends on its behaviour towards soap

B. The temporary hardness is due to the presence of Ca and Mg

bicarbonates

C. Permanent hardness is due to the presence of soluble Ca and Mg

sulphates, chloride and nitrates

D. Permanent hardness can be removed by boiling the water

Answer: D

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84. The molarity of pure water at $4^\circ C$ is

A. 1 M

 $\mathsf{B}.\,2.5\;\mathsf{M}$

C.5M

D. 55.5 M

Answer: D

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85. Whivh of the following is not a hard water ?

A. Water containing $CaCl_2$

B. Water containing dil. HCl

C. Water containing $MgSO_4$

D. None of these.

Answer: D

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86. Heavy water is used in atomic reactor as

A. Coolant

B. Moderator

- C. Both moderator and coolant
- D. Neither coolant nor moderator.

Answer: C

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87. Heavy water freezes at

A. $0\,^\circ\,\text{C}$

 $\text{B.}~3\cdot8^{\circ}\,\text{C}$

C. 38°

 $\mathrm{D.}-0\cdot38^{\,\circ}\,\mathrm{C.}$

Answer: B

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88. The pH of D_2O and H_2O at 298 K is

A. $7 \cdot 0, 7 \cdot 0$

B. $7 \cdot 35, 7 \cdot 0$

C. $7 \cdot 0, 6 \cdot 85$

D. $6 \cdot 85, 7 \cdot 35.$

Answer: B

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89. Which of the following is not true?

A. Ordinary water is electrolysed more rapidly than D_2O

B. Reaction between H_2 and Cl_2 is much faster than D_2 and Cl_2

C. D_2O freezes at lower temperature than H_2O

D. Bond dissocition energy for D_2 is greater than H_2 .

Answer: C

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90. Which of the following will determine whether the given colourless

liquid is water or not ?

A. melting

B. tasting

C. phenolphthalein

D. adding a pinch if anhydrous $CuSO_4$.

Answer: D

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91. Lead pipes are not used for carrying drinking water because

A. They are covered with a coating of lead carbonate

B. They are corroded by air and moisture

C. Water containing dissolved air attacks lead forming soluble

hydroxide

D. None of the above.

Answer: C



92. A colourless gas obtain by the electrolysis of NaCl Nelson's cell is made to combine with an element X. The resulting compound has low mellting pt. and boiling pt. It can also act as weak reducing pt. and boiling pt. It can also act as weak reducing pt. and boiling pt. It can also act as weak reducing agent. The element X forms oxides and hydroxides of the form X_2O_3 and $X(OH)_3$. X does not react with HCl. The resulting compound is

B. B_2H_6

 $\mathsf{C.} BCl_3$

 $\mathsf{D.}\, Ga_2Cl_6.$

Answer: C

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93. Which one of the following removes temporary hardness of water ?

A. Slaked lime

B. Plaster of paris

C. Cuprous

D. Hydrolith.

Answer: A

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94. Which of the following will cause softening of hard water ?

A. Passing it through cation exchange resin

B. Passing it through anion exchange resin

C. Passing it through sand

D. Passing it through alumine.

Answer: A

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95. Permanent hardness can be removed by adding

A. Cl_2

B. Na_2CO_3

 $\mathsf{C.}\, Ca(OCl)Cl$

D. K.

Answer: B



96. Permutil is technical name given to

A. Aluminates of calcium and sodium

B. Silicates of calcium and sodium

C. Hydrated silicates of aluminium and sodium

D. Silicates of calcium and magnesium.

Answer: C

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97. The approximate mass of tritium oxide molecule is

A. 18 amu

B. 20 amu

C. 22 amu

D. 24 amu.

Answer: C

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98. Heavy water is called as such because it

A. is a dimer than common water

B. is an oxide of protium

C. has a heavy or bad taste

D. has a heavier isotope of hydrogen.

Answer: D

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99. When sulphur trioxide is heated with heavy water the products are

A. Deutero-sulphuric acid

- B. Deuterium sulphuric acid
- C. Deuterium and sulphuric acid
- D. None of the above.

Answer: A

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100. High dipole moment of water $(1 \cdot 03D)$ justifies that

A. it is not linear molecule

B. it is a universal solvent

C. it has higher density than ice

D. it is neutral towards litmus.

Answer: A



101. Which of the following substances does not produce ammonia on

reaction with water ?

A. $CaCN_2$

B. AlN

 $\operatorname{C.} Ca(CN)_2$

 $\mathsf{D.}\, Mg_3N_2.$

Answer: C

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102. In which of the following reactions does reactions does water act as

oxidising agent ?

A. $3F_2+3H_2O
ightarrow 6HF+O_3$

$$\mathsf{B}.\, C(g) + H_2O(g) \to CO(g) + H_2(g)$$

C. $Ca_2P_2+6H_2O
ightarrow 3Ca(OH)_2+2PH_3$

 $\mathsf{D.}\, 2Cl_2+2H_2O\rightarrow 4HCl+Cl_2.$

Answer: C

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103. The formula of sodium zeolite which is used in permutit process for softening water is

A. $Na_2OAl_2O_3Si_2OxH_2O$

 $\mathsf{B.} Na_2Al_2Si_2O_4xH_2O$

C. $Na_2OAlO_3SiO_4xH_2O$

D. $K_2Al_2SiO_8xH_2O$.

Answer: A



- C. precipitating the Ca^{2+} and Mg^{2+} ions as phophates
- D. precipitating the Ca^{2+} and Mg^{2+} ions as sulphates.

Answer: A

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105. The compound sodium polymetaphosphate $\left(Na\left[Na_4(PO_3)_6\right]\right)$ is

called calgon because

A. It was developed by the scientist named Challaghan

B. It was developed first in California

C. It refers to calcium gone

D. It is based on the name of the company which developed it.

Answer: C

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106. Which of the following operations would cause removal of temporary

hardness of water ?

- A. Passing CO_2 through is
- B. Passing SO_2 through is
- C. adding calculated amount of $Ca(OH)_2$
- D. adding calculated amount of sodium hypophosphate.

Answer: C

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107. A mixture of which pair of species react with water to produce a pure colourless gas gives white fumes with HCl ?

A. Calcium hydride, calcium carbide

B. Calcium carbine and aluminium nitride

C. Magnesium nitride and calcium nitride

D. Calcium phosphide and calcium cyanamida.

Answer: C

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108. The maximum tolerable limit of degree of hardness in water required

for our daily needs is approximately

A. 10 to 15 ppm

B. 100 to 150 ppm

 $C. 10^3 \text{ ppm}$

D. 700 to 800 ppm.

Answer: B

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109. Of the two solvent H_2O and D_2O , NaCl dissolves

A. equally in both

B. more in D_2O

C. more in H_2O

D. only in H_2O .

Answer: C

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110. Mass precentage of deuterium in heavy water is

A. same as that of protium in water

B. 20

C. 11 · 1

D. unpredictable.

Answer: B

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Hydrogen Peroxide

1. Hydrogen peroxide is used as

A. Oxidising agent

B. Reducing agent

C. Both as oxidising and reducing agent

D. Drying agent.

Answer: C



2. In the laboratory, H_2O_2 is prepared by the action of

A. cold H_2SO_4 on BaO_2

B. aqueous alkali on Na_2O_2

C. MnO_2 and cold H_2SO_4

D. dilute HCl and MnO_2 .

Answer: A

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3. The reaction of $H_2S+H_2O_2
ightarrow S+2H_2O$ manifests

A. Acidic nature of H_2O_2

- B. Alkaline nature of H_2O_2
- C. Oxidising action of H_2O_2
- D. Reducing action of H_2O_2 .

Answer: C

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4. The oxide that given H_2O_2 treatment with dilute acid is

A. Pb_3O_4

 $\mathsf{B.}\,Na_2O_2$

 $\mathsf{C}. MnO_2$

D. LiO_2 .

Answer: B

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5. 20 volume H_2O_2 solution has a strength of about

A. 30~%

 $\mathbf{B.6}~\%$

C. 3%

D. 10~% .

Answer: B

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6. H_2O_2 is manufactured these days

A. by the action of H_2O_2 on BaO_2

B. by the action of H_2SO_4 on Na_2O_2

C. by electrolysis of $50~\%~H_2SO_4$

D. by burning hydrogen in excess of oxygen.

Answer: C



8. 1 ml of H_2O_2 solution given 10 ml of O_2 at NTP. It is :

A. 10 vol. H_2O_2

B. 20 vol. H_2O_2

C. 30 vol. H_2O_2

D. 40 vol. H_2O_2

Answer: A

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9. Which substance does not speed up to decomposition of H_2O_2 ?

A. Glycerol

B. Pt

C. Gold

D. MnO_2 .

Answer: A

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10. Which of the following cannot be oxidised by H_2O_2 ?

A. O_3

B. KI/HCI

C. PbS

 $\mathsf{D.}\, Na_2SO_3.$

Answer: A

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11. Which subtance cannot be reduced by H_2O_2

A. $KMnO_4 / H_2SO_4$

 $\mathsf{B.}\,K_2 Cr_2 O_7\,/\,H_2 SO_4$

 $\mathsf{C}.Ag_2O$

D. Fe^{3+} .

Answer: D



12. Which of the following statements is incorrect ?

A. H_2O_2 can act as an oxidising agent

B. H_2O_2 can act as a reducing agent

C. H_2O_2 has acidic properties

D. H_2O_2 has basic properties.

Answer: D



13. $H_2 {\cal O}_2$ is

A. poor polar solvent than water

- B. better polar solvent than H_2O
- C. both have equal polarity
- D. better polar solvent but its strong auto oxidising ability limits its

use as such.

Answer: C

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14. H_2O_2 used in rockets has the concentration

A. 50~%

 $\mathbf{B.~70~\%}$

 $\mathsf{C}.\,30~\%$

D. 90~%

Answer: A

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15. Decomposition of H_2O_2 is prevented by

A. NaOH

B. MnO_2

C. Acetanilide

D. Oxalic acid.

Answer: C

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16. 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 autooxidation on prolonged standing.

D. None of these.

Answer: C



17. H_2O_2 on reacting with ethene gives

A. Ethane

B. Ethanal

C. Ethylene glycol

D. Ethanol

Answer: C



18. Which of the following is wrong about H_2O_2 ?

It is used

A. As aerating agent in production of sponge rubber

B. As an antichlor

C. For restoring white colour of blackened lead painting

D. None of the above.

Answer: D

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19.
$$H_2O_2
ightarrow 2H^+ + O_2 + 2e^-, E^\circ = -0.68V.$$

This equation represents which of the following behaviour of H_2O_2

A. Reducing

B. Oxidising

C. Acidic

D. Catalytic.

Answer: A



20. Which of the following is a true structure of H_2O_2 ?





Answer: B

21. The structure of H_2O_2 is

A. Open book like

B. Linear

C. Closed book

D. Pyramidal.

Answer: A

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22. On shaking H_2O_2 with acidified potassium dichromate and ether, etheral layer becomes

A. green

B. red

C. blue

D. black.

Answer: C



23. The air oxidation of which of the following organic compound produces hydrogen peroxide ?

A. 2-Ethylanthracene

B. 2-Ethyl anthraquinol

C. 2-Ethylanthraquinone

D. β -naphathol.

Answer: B

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24. In gaseous hydrogen peroxide, the dihedral angle between H-atom is

 $x^{\,\circ}\,$ but in solid state it is $y^{\,\circ}.$ The values of x and y are respectively

A. $94 \cdot 8, 94 \cdot 8$

B. $111 \cdot 5, 90 \cdot 2$

 $C.90 \cdot 2, 90 \cdot 2$

D. $111 \cdot 5, 111 \cdot 5.$

Answer: B

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25. When H_2O_2 is added to ice cold solution of acidified potassium dichromate containing ether. The contents are shaken allowed to stand, then

A. blue colour is obtained in ether due to formation of $Cr_2(SO_4)_3$

B. a blue colour is obtained in ether due to formation of CrO_5

C. CrO_3 is formed which dissolves in ether to give blue colour

D. Chromyl chloride is formed.

Answer: B

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26. What is true H_2O_2 ?

A. It is colourless, syrupy liquid in pure state

B. It is colourless and has a flat taste

C. It smells like nitric acid

D. It is appreciably soluble in alcohol and ether.

Answer: A,B,D

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27. When a mixture of ammonium sulphate and $50~\%~H_2SO_4$ is electrolysed, the products formed at anode and cathode are

A. H_2 and H_2O_2

- B. $(NH_4)_2S_2O_8$ and H_2
- C. H_2 and $NaHSO_4$

D. H_2O_2 and H_2 .

Answer: B

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28. The bleaching properties of hydrogen peroxide is due to its

A. acidic nature

B. ability to liberate nascent oxygen

C. reducing nature

D. ability to liberate nascent hydrogen

Answer: B



29. The hybrid state and oxidation state of two oxygen atoms in H_2O_2 are respectively

A.
$$sp^2, \ -1$$

B. $sp^3, \ +1$
C. $sp^3, \ -1$
D. $sp^2, \ -2.$

Answer: C

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30. The name of the perhydrol is given to

A. solution of Na_2O_2 in ether

B. dilute solution of phenol in ether

C. dilute solution of H_2O_2 in water

D. dilute solution of CrO_4 in ether.

Answer: C

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31. In which of the solution hydrogen peroxide neither acts as oxidising agent nor reducing agent ?

- A. $Na_2CO_3 + H_2O_2
 ightarrow$
- B. $PbS + H_2O_2
 ightarrow$
- C. $Cr_2O_7^{2\,-} + H^{\,+} + H_2O_2
 ightarrow$
- D. $SO_3^- + H_2O_2
 ightarrow$

Answer: A



Answer: B

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Revision Questions From Competitive Exams

1. Hydrogen directly combines with

A. Au

B. Cu

C. Ni

D. Ca.

Answer: D

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2. Chemical A is used for water softening to remove temporary hardness. A reacts with sodium carbonate to generate caustic soda. When CO_2 is bubbled through a solution of A, it turns cloudy. What is the chemical formula of A ?

A. $CaCO_3$

B. CaO

 $\mathsf{C.}\, Ca(OH)_2$

 $\mathsf{D.}\, Ca(HCO_3)_2.$

Answer: C

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

A. 1:1

 $\mathsf{B}.\,1\!:\!2$

C.2:1

D. 9:4.

Answer: A

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4. Which one of the following is not an isotope of hydrogen ?

A. Tritium

B. Deuterium

C. Ortho hydrogen

D. None of the above.

Answer: C

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5. If an isotope of hydrogen has two neutrons in its atom, its atomic number and mass number will respectively be

A. 2 and 1

B. 3 and 1

C. 1 and 1

D. 1 and 3

Answer: D



6. Which is used in the laboratory for last drying of neutral gases?

A. Phosphorus pentoxide

B. Active charcoal

C. Anhydrous calcium choride

D. Na_3PO_4 .

Answer: C

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7. Which is the lightest gas ?

A. Nitrogen

B. Helium

C. Oxygen

D. Hydrogen.

Answer: D



8. Calgon used as water softener is

- A. $Na_2[Na_4(PO_3)_6]$
- B. $Na_4[Na_4(PO_3)_6]$
- $\mathsf{C}.\,Na_2\big[Na_4(PO_4)_5\big]$
- $\mathsf{D}.\, Na_4 \big[Na_2 (PO_4)_6 \big].$

Answer: A

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9. which of the following on oxidation gives H_2O_2 ?

- A. 2-Ethylanthraquinol
- B. 2-Ethylanthraquinone
- C. Anthracene
- D. 2-Ethylanthracene.

Answer: A

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10. One would expect proton to have very large

A. Charge

B. Ionisation potential

C. Hydration energy

D. Radius.

Answer: C



11. K_a of H_2O_2 is of the order of

A. 10^{-12}

B. 10^{-14}

 $C. 10^{-16}$

D. $10^{\,-\,10}$

Answer: A

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12. Hydrogen behaves as an oxidising agent in its reaction with

A. Chlorine

B. Nitrogen

C. Sodium

D. Sulphur.

Answer: C



13. Water is said to permanently hard when it contains

A. Sulphates of Mg and Ca

B. Bicarbonates of Mg and Ca

C. Sulphates of Cu and Hg

D. Carbonates and bicarbonates of Mg and Ca.

Answer: A



14. Sodium sulphate is soluble in water but barium sulphate is insoluble because

A. the hydration energy of Na_2SO_4 is more than its lattice energy

B. the lattice energy of $BaSO_4$ is more than its hydration energy

C. the lattice energy has no role to play in solubility

D. Both A and B.

Answer: D

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15. The composition of tritium is

A. 1 electron, 1 proton, 1 neutron

B. 1 electron, 2 proton, 1 neutron

C. 1 electron, 1 proton, 2 neutron

D. 1 electron, 1 proton, 3 neutron

Answer: C

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16. The proerty hydrogen which distinguishes it from alkali metals is

A. its electropositive character

B. its affinity for non metals

C. its reducing character

D. its non-metallic character.

Answer: D

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17. The hydride ion H^- is a stronger base than its hydroxide ion OH^- . Which of the following reactions will occurs if sodium hydride (NaH) is dissolved in water ?

A.
$$H^{\,-}(aq) + H_2 O
ightarrow H_3 O^{\,-}(aq)$$

B.
$$H^{\,-}(aq)+H_2O(l)
ightarrow OH^{\,-}(aq)+H_2(g)$$

C. $H^{\,-}(aq) + H_2 OC(l)
ightarrow \,$ No reaction

D. None of these.

Answer: B



18. Which of the following evolve hydrogen on reacting with cold nilute

nitric acid ?

A. Mg

B. Al

C. Fe

D. Cu.

Answer: A

19. The volume strength of $1\cdot 5$ N H_2O_2 solution is

A. $4 \cdot 8$

 $\mathrm{B.5}\cdot 2$

 $C.8 \cdot 8$

 $\mathsf{D.8}\cdot 4.$

Answer: D

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20. Hydrogen accepts an electron to form inert gas configuration. In this

resembles

A. Halogen

B. Alkali metals

C. Chalcogens

D. Alkaline earth metals.

Answer: A

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21. Which of the following is correct for hydrogen?

A. It can form bonds in +1 as well as -1 oxidation state

B. It is always collected at cathode

C. It has a very high ionization potential

D. It has same electronegativity as halogens.

Answer: A

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22. D_2O is used more in

A. chemical industry

B. nuclear reactor

C. pharmaceutical proparation

D. insecticide preparation.

Answer: B

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23. What is heavy water?

A. $H_2 O^{17}$

 $\mathsf{B.}\,H_2O^{18}$

 $\mathsf{C}.\, D_2 O$

 $\mathsf{D}.\,H_2O.$

Answer: C



Answer: B



25. Which of the following is formed by the action of water on sodium

peroxide?

A. H_2

 $\mathsf{B.}\,N_2$

 $\mathsf{C}.O_2$

 $\mathsf{D.}\,CO_2.$

Answer: C

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26. which of the following will not disolace hydrogen ?

A. Ba

B. Pb

C. Hg

D. Sn.

Answer: C

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27. The absorption of hydrogen by palladium is called

A. Hydration

B. Reduction

C. Occlusion

D. Hydrogenation.

Answer: C

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28. The alum used for purifying water is

A. Ferric alum

B. Chrome alum

C. Potash alum

D. Ammonium alum.

Answer: C



29. Which of the following metal will not reduce H_2O ?

A. Ca

B. Fe

C. Cu

D. Li.

Answer: C

Watch Video Solution

30. A metal which does not liberate $H_2(g)$ from acids is ,
A. Cu

B. Fe

C. Mn

D. Zn.

Answer: A

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31. The boiling point of water is exceptionally high because

A. There is covalent bond between H and O

- B. Water molecule is linear
- C. Water molecules associate due to hydrogen bonding
- D. Water molecule is not linear

Answer: C

32. The percentage by weight of hydrogen in H_2O_2 is

A. $5\cdot88$

 $\mathrm{B.}\,6\cdot25$

C. 25

D. 50.

Answer: A



33. Consider the follwing statements :

I. Atomic hydrogen is obtained by passing hydrogen throgh an electric arc.

II. Hydrogen gas will not reduce heated aluminium oxide.

III. Finely divided palladium absorbs large volumn of hydrogen gas.

IV. Pure nascent hydrogen is obtained by reacting /na with C_2H_5OH . Which of the above statements is/are correct ?

A. I Alone

B. II Alone

C. I,II, and III

D. II,III, and IV.

Answer: C

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34. Match List I with List II and select the correct answer using the codes

given below the list :

	List I	List II
1.	Heavy water	(a)Bicarbonates of Mg and Ca in water
2.	Temporary hard water	(b)No foreign ions in water
3.	Soft water	$(c)D_2O$
4.	Permanent hard water	(d)Sulphates and chlorides of Mg and Ca in w

A. 1-c, 2-d, 3-b, 4-a

B. 1-b, 2-a, 3-c, 4-d

C. 1-b, 2-d, 3-c, 4-a

D. 1-c, 2-a, 3-b, 4-d

Answer: D

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35. The H - O - H angle in water molecule is about

A. $90\,^\circ$

B. $180^{\,\circ}$

C. 102°

D. $105^{\,\circ}$

Answer: D

36. When two ice cubes are pressed over each other, they unite to form one cube. Which of the following forces is responsible to hold them together ?

A. Hydrogen bond formation

B. van der Waals force

C. Covalent attraction

D. Ionic interaction.

Answer: A

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37. The metal that cannot displace hydrogen from dil. HCl is

A. Al

B. Fe

C. Cu

D. Mg.

Answer: C

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38. In which of the following reactions, H_2O_2 act as a reducing agent ?

A.
$$PbO_2(s)+H_2O_2(aq)
ightarrow PbO(s)+H_2O(l)+O_2(g)$$

B.
$$Na_2SO_3(aq) + H_2O_2(aq)
ightarrow Na_2SO_4(aq) + H_2O(l)$$

C.
$$2KI(aq) + H_2O_2(aq)
ightarrow 2KOH(aq) + I_2(s)$$

D.
$$KNO_2(aq) + H_2O_2(aq)
ightarrow KNO_3(aq) + H_2O(l)$$

Answer: A

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39. The process used for the removal of hardness of water is

A. Calgon

B. Baeyer

C. Serpeck

D. Hoope.

Answer: A

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40. Which of the following acts as both reducing and oxidising agents ?

A. H_2SO_4

 $\mathsf{B.}\,H_2O_2$

C. KOH

D. $KMnO_4$.

Answer: B

41. What is formed when calcium carbide reacts with heavy water?

A. C_2D_2

 $\mathsf{B.}\, CaD_2$

 $\mathsf{C}.\,Ca_2D_2O$

 $D. CD_2.$

Answer: A

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42. Pure water can be obtained from sea water by

A. Centrifugation

B. Plasmolysis

C. Racerse osmosis

D. Sedimentation.

Answer: C



43. Action of water or dilute mineral acids on metals can give

A. Monohydrogen

B. Tritium

C. Dihydrogen

 $\mathsf{D}.\, D_2.$

Answer: C

44. Metal which does not react with cold water but evolves H_2 with steam is :

A. Na

B. K

C. Pt

D. Fe.

Answer: D

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45. Whichh of the following is correct about heavy water ?

A. Water at 4° C having maximum density is known as heavy water.

B. It is heavier than water (H_2O) .

C. It is formed by the combination of heavier isotope of hydrogen and

oxygen.

D. None of these.

Answer: C



46. Which of the following could act as a propellant for rockets ?

A. Liquid hydrogen + liquid nitrogen

B. Liquid oxygen + liquid argon

C. Liquid hydrogen + liquid oxygen

D. Liquid nitrogen + liquid oxygen.

Answer: C



47. The reagent commonly used to determine hardness of water titrimetrically is :

A. oxalic acid

B. sodium thiosulphate

C. disodium salt of EDTA

D. sodium citrate.

Answer: C

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48. Shape of H_2O_2 molecule is

A. non planar

B. linear

C. circular

D. planar.

Answer: A

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49. Water softening by Clarke's process uses

A. calcium bicarbonate

B. sodium bicarbonate

C. calcium hydroxide

D. sodium aluminate.

Answer: C

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50. One mole of magnesium nitride on reaction with an excess of water

gives

A. one mole of ammonia

B. one mole of nitric acid

C. two moles of ammonia

D. two moles of nitric acid.

Answer: D

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51. Oxidation state of oxygen in H_2O_2 is

- $\mathsf{A.}-2$
- $\mathsf{B.}-1$
- C. 0
- $\mathsf{D.}+2.$

Answer: B

52. Which statement about zeolite is false ?

A. They are used as cation exchangers

B. They have open structure which enables them to take up small molecules

C. Zeolites are aluminosilicates having three dimensional network

D. None of the SiO_4^{4-} units are replaced by AlO_4^{5-} and AlO_6^{9-} ions in zeolites.

Answer: D

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53. When CO_2 is bubbled through a solution of barium peroxide in water

A. O_2 is released

- B. Carbonic acid is formed
- C. H_2O_2 is formed

D. no reaction occurs.

Answer: C

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54. By adding which of the following process, permanent hardness of water can be removed.

A. soda lime

B. sodium bicarbonate

C. washing soda

D. sodium chloride.

Answer: A

55. A commercial sample of hydrogen peroxide is labelled as 10 volume.

Its percentage stregth is nearly

A. 3~%

 $\mathsf{B.1}\,\%$

 $\mathsf{C}.\,90\,\%$

D. 10~% .

Answer: D

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56. Which of the properties of interstitial hydrides is correct?

A. They generally form non-stoichiometric species

B. They give rise to metals fit for fabrication

C. On thermal decomposition they afford a source of pure hydrogen

D. They can be used as hydrogenation catalysts.

Answer: A



57. Which of the following is not correct regarding the electroplytic perparation of H_2O_2 ?

A. lead is used as cathode

B. $50~\%~H_2SO_4$ is used

C. Hydrogen is liberated at anode

D. sulphuric acid undergoes oxidation.

Answer: C

58. Which one of the following reactions does not form gaseous product

A. $PbO_2 + H_2O_2$

- B. Acidified $KMnO_4 + H_2O_2$
- $\mathsf{C}. PbS + H_2O_2$
- D. $Cl_2 + H_2O_2$.

Answer: C

?

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59. Which one of the following is a ture peroxide ?

A. NO_2

 $\mathsf{B.}\,MnO_2$

 $\mathsf{C}.BaO_2$

 $\mathsf{D.}\,SO_2.$

Answer: C



60. What is false about H_2O_2 ?

A. act as both oxidising and reducing agent

B. two OH bonds lie in the same plane

C. pale blue liquid

D. can be oxidised by O_3 .

Answer: B



61. The hardness of water sample containing $0 \cdot 002$ mole of magnesium sulphate dissolved in a litre of water is expressed as

A. 20 ppm

B. 200 ppm

C. 2000 ppm

D. 120 ppm.

Answer: B

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62. When hydrogen peroxide is added to acidified potassium dichromate, a blue colour is produced due to formation of :

A. CrO_3

 $\mathsf{B.}\, Cr_2O_3$

 $C. CrO_5$

D. CrO_4^{2-} .

Answer: C

63. Which of the following is the correct order of increasing enthalpy of vaporisation ?

- A. $NH_3 < PH_3 < ArH_3$
- B. $ArH_3 < PH_3 < NH_3$
- C. $PH_3 < ArH_3 < NH_3$
- D. $NH_3 < ArH_3 < PH_3$

Answer: C

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64. in alkaline medium, H_2O_2 reacts with $Fe^{3\,+}$ and $Mn^{\circ\,+}$ respectively

to give :

A.
$$Fe^{4+}$$
 and Mn^{4+}

B.
$$Fe^{2+}$$
 and Mn^{2+}

 $\mathsf{C}. Fe^{2+}$ and Mn^{4+}

D.
$$Fe^{4+}$$
 and Mn^{2+} .

Answer: C

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65. Hydrogen gas is not liberated when the following metal is added to

 $\mathsf{dil}.\,HCl\colon$

A. Mg

B. Sn

C. Ag

D. Zn.

Answer: C

66. The bond angle and dipole moment of water respectively are :

```
A. 109 \cdot 5^{\circ}, 1 \cdot 84 D
B. 107 \cdot 5^{\circ}, 1 \cdot 56 D
C. 104 \cdot 5^{\circ}, 1 \cdot 84 D
D. 102 \cdot 5^{\circ}, 1 \cdot 56 D.
```

Answer: C

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67. Usually boiling of water is the result of

A. intermolecular hydrogen bonding

B. intramolecular hydrogen bonding

C. Both (A) and (B)

D. High specific heat.

Answer: A



68. In transforming 0.01 mole of PbS to $PbSO_4$, the volume of '10 volume

 H_2O_2 required will be :

A. $11 \cdot 2 \text{ ml}$

 $\text{B.}\,22\cdot4\,\text{ml}$

 $\text{C.}~33\cdot6~\text{ml}$

D. $44 \cdot 8$ ml.

Answer: D



69. Which one of the following statements is incorrect with regard to and

para dihydrogen ?

- A. They are nuclear spin isomers
- B. The ortho isomer has zero nuclear spin whereas the para isomer

has one nuclar spin.

C. The para isomer is favoured at low temperature.

D. It is never possible to obtain $100~\%\,$ pure ortho isomer.

Answer: B

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70. The salt responsible for permanent hardness of H_2O is

A. Na_2SO_4

B. $Mg(HCO_3)_2$

C. NaCl

D. $MgCl_2$.

Answer: D

71. In which of the following reactions, H_2O_2 is acting as a reducing agent?

A. $SO_2 + H_2O_2
ightarrow H_2SO_4$ B. $2KI + H_2O_2
ightarrow 2KOH + I_2$ C. $PbS = 4H_2O_2
ightarrow PbSO_4 + 4H_2O$ D. $Aq_2O + H_2O_2
ightarrow PbSO_4 + 4H_2O$

Answer: D

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72. Blanked oil painting can restored with original from by the action of

A. Chlorine

 $\mathsf{B.}\,BaO_2$

 $\mathsf{C}. H_2O_2$

 $\mathsf{D}.\,MnO_2.$

Answer: C

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73. Which of the following can produce hydrogen from water

A. Heated stanic oxide

B. Heated iron

C. Heated aluminium oxide

D. Heated copper oxide.

Answer: B

74. H_2 will not reduce which of the following oxide

A. Aluminium oxide

B. Calcium oxide

C. Ferrous oxide

D. None of the above.

Answer: D

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75. Which one of the following compounds is a peroxide?

A. KO_2

 $\mathsf{B.}\,BaO_2$

 $\mathsf{C}.MnO_2$

 $D. NO_2.$

Answer: B



76. The reagent(s) used for softening the temporary hardness of water is

(are):

A. $Ca_3(PO_4)_3$

 $\operatorname{B.} Cu(OH)_2$

 $\mathsf{C.}\,Na_2CO_3$

D. NaOCl.

Answer: B::C



77. In the reaction, $H_2S+H_2SO_4
ightarrow S+2H_2O$

A. H_2S is an acid and H_2O_2 is a base

B. H_2S is a base and H_2O_2 is an acid

C. H_2S is hydrolysed to S

D. H_2S is a reducing agent and H_2O_2 is a oxidising agent.

Answer: D

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78. In the reaction

 $Ag_2O+H_2O_2
ightarrow 2Ag+H_2O+O_2$, H_2O_2 acts as

A. reducing agent

B. oxidising agent

C. bleaching agent

D. none of these.

Answer: A

79. Very pure hydrogen (99.9~%) can be made by which of the following

processes ?

A. Mixing natural hydrocarbons of higher molecular mass

B. Electrolysis of water

C. Reaction of salt like hydrides with water

D. Reaction of methane with steam.

Answer: B

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80. Syngas is a mixture of

A. $CO_2 + H_2 + CO$

 $\mathsf{B.}\, CO + H_2$

 $C.CO + CO_2$

 $\mathsf{D.} CO + N_2.$

Answer: A

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81. The strength of H_2O_2 (wg/litre) in $11\cdot 2$ volume solution of H_2O_2 is

A. 17

B. 51

C. 34

D. 85

Answer: C

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

processes ?

A. Reaction of methane with steam

B. Mixing natural hydrocarbons of high molecular weight

C. Electrolysis of water

D. Reaction of salts like hydrides with water.

Answer: C

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Selected Straight Objective Type Mcqs

1. Hydrogen resembles

A. alkali metals

B. Noble gases

C. halogens

D. carbon.

Answer: A::C::D

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2. The s-block hydride with covalent polymeric structure are

A. LiH

 $\mathsf{B.}\,BeH_2$

C. NaH

 $\mathsf{D}.\,MgH_2$

Answer: B::D

3. What is true about ice ?

A. Its density is more than water

B. It is a good conductor of heat

C. It is a thermal insulator

D. Its density is less than water.

Answer: C::D

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4. Which of the following is/are hard water (s) ?

A. Water containing some potash alum

B. Water containing a few drops of HCl

C. Water containing common salt

D. Water containing calcium nitrate.
Answer: A::B::D



6. Hydrogen can be obtained from water by

A. reaction with metal oxides

B. reaction with non-metal oxides

C. reaction with metals

D. reaction with metal hydrides.

Answer: C::D

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7. Hydrogen peroxide is

A. a stronger acid than water

B. a weaker acid than water

C. an oxidising agent

D. a reducing agent.

Answer: A::C::D

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8. Hydrogen can be obtained from water, by the action of water on

A. Calcium carbide

B. Calcium hydride

C. Calcium oxide

D. Calcium.

Answer: B::D

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9. Pick out the correct statement (s)

A. Hydrogen forms more chemical compounds than carbon.

B. Hydrogen is most abundant element in the universe.

C. Hydrogen is practically absent in our atmosphere.

D. Hydrogen can behave as a metals under very high pressure.

Answer: A::B::C::D



10. Pick out the correct statement (s)

A. Natural hard water is toxic in nature

B. Natural hard water does not produce lather with soap

C. Water containinng some potash alum is a hard water

D. Water obtained by zeolite process is not pure water.

Answer: B::C::D



11. The metal (s) which react with NaOH(aq) to give H_2 under ordinary conditions, is (are)

A. Sn

B. Al

C. Fe

D. Zn.

Answer: A::B::D

Watch Video Solution

12. Chromic salts (Cr^{3+}) can be reduced to chromous salts (Cr^{2+}) by adding metals(s) to the salt solution acidified with dil. H_2SO_4

A. Sn

B. Fe

C. Zn

D. All the three.

Answer: C

13. The acid not suitable for the preparation of H_2 by action with metals

is

A. HCl

 $\mathsf{B.}\, CH_3COOH$

 $\mathsf{C}.HNO_3$

 $\mathsf{D}.\,H_2SO_4.$

Answer: C

View Text Solution

14. Pick the odd one out

A. Sodium borohydride reacts very slowly with cold water to

B. Sodium borohydride reacts very violently with cold water to

produce H_2

C. Solubility of sodium borohydride in water at $25\,^\circ$ C is $10\cdot05$ g/mL

D. Melting point of sodium borohydride is $500^{\circ}C$.

Answer: B

O Watch Video Solution

15. Hydrogen is evolved the action of cold dilute HNO_3 on :

A. Fe

B. Mn

C. Cu

D. Al.

Answer: B

Watch Video Solution

16. HCl is added to following oxides. Which one would give H_2O_2 ?

A. MnO_2

B. PbO_2

C. BaO

D. None of the above.

Answer: D

Watch Video Solution

17. Which one of the following chlorides will not fume in air ?

A. $BiCl_3$

B. CCl_4

 $\mathsf{C}.\,PCl_5$

D. None of the air.

Answer: B

View Text Solution

18. Hydrogen gas will not reduce:

A. heated cupric oxide

B. heated ferric oxide

C. heated stannic oxide

D. heated aluminium oxidi.

Answer: D



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

A. PbO_2

 $\operatorname{B.} Na_2O_2$

 $\mathsf{C}.MnO_2$

D. TiO_2 .

Answer: B

Watch Video Solution

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

A. 6

B. 5

C. 4

D.3.

Answer: D

21. 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+} ions

C. Mg^{2+} ions

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

Answer: D

Watch Video Solution

22. The amount of H_2O_2 present in 1 L of $1 \cdot 5NH_2O_2$ sodium is

A. $2\cdot 5\,\mathrm{g}$

 $\mathrm{B.}\,25\cdot5\,\mathrm{g}$

 $\mathsf{C.3} \cdot \mathsf{0}\,\mathsf{g}$

 $\mathsf{D.8}\cdot 0~\mathsf{g.}$

Answer: B

Watch Video Solution

23. The maximum possible number of hydrogen bonds a water molecule

can form is

A. 1

B. 2

C. 3

D.4.

Answer: D

Watch Video Solution

24. Which of the following pairs will not produce dihydrogen gas ?

A. Cu + HCl (dil.)

B. $Fe + H_2SO_4$

C. Mg + steam

D. Na + alcohol.

Answer: A

Watch Video Solution

25. Hydrolysis of one mole of peroxodisulphuric acid produces

A. two moles of sulphuric acid

B. Two moles of peroxomonosulphuric acid

C. One mole of sulphuric acid one mole of peroxomonosulphuphuric

acid

D. One mole of sulphuric acid, one mole of peroxomonosulphuphuric

acid and one mole of hydrogen peroxide.

Answer: C

Watch Video Solution

26. The critical temperature of water is higher than that of O_2 because

the H_2O molecule has

A. fewer electrons than oxygen

B. two covalent bonds

C. V-shape

D. Dipole moment.

Answer: D

Watch Video Solution

27. One mole of calciium phosphide on reaction with excess water gives

A. one mole of phosphene

- B. two moles of phosporic acid
- C. two moles of phosphine
- D. one mole of phosphorus pentaoxide.

Answer: C

Watch Video Solution

28. 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



29. The correct order in which the O-O bond length increases in the following is

A. $O_3 < H_2O_2 < O_2$ B. $O_2 < O_3 < H_2O_2$ C. $O_2 < H_2O_2 < O_3$ D. $H_2O_2 < O_2 < O_3$.

Answer: B



30. Which one of the following ionic species has the greatest proton

affinity to form stable compound ?

A. $I^{\,-}$

B. HS^{-}

 $\mathsf{C.} NH_2^-$

D. $F^{\,-}$.

Answer: C

Watch Video Solution

31. In context with the industrial preparation of hydrogen from water gas

 $\left(CO+H_{2}
ight)$, which of the following is the correct statement ?

A. CO is oxidised to CO_2 with steam in the presence of a catalyst

followed by absorption of CO_2 in alkali

B. CO and H_2 are fractionally separated using difference in their densities

C. CO is removed by absorption in aqueous Cu_2Cl_2 solution

D. H_2 is removed through occlusion with Pd.

Answer: A

Watch Video Solution

Reason Assertion Type Mcqs

1. Assertion (A) Hydrogen combines with order elements by losing, gaining or sharing of electrons.

Reason (R) Hydorgen forms electrovalent and covalent bonds with other elements.

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 fales

D. A is fales but R is true.

Answer: A

2. Assertion (A) Calgon is used for removing CA^{2+} and Mg^{2+} ions from hard water.

Reason (R) Calgon forms precipitates with $Ca^{2+}~{
m and}~Mg^{2+}$

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 fales

D. Both A and R are fales.

Answer: D

View Text Solution

3. Assertion (A) Decomposition of H_2O_2 is a disproportionation reaction. Reason (R) H_2O_2 molecule simultaneously undergoes oxidation and reduction. 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 fales

D. A is fales but R is true.

Answer: A

Watch Video Solution

4. Assertion : H_2O_2 has higher boiling point than water

Reason : It has stronger dipole interactions than that shown by water.

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 fales

D. A is fales but R is true.

Answer: C

5. Assertion (A) H_2O_2 is not stored in glass bottles.

Reason (R) Alkali oxides present in glass catalyse the decomposition of H_2O_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 fales

D. A is fales but R is true.

Answer: A

Watch Video Solution

6. Assertion (A) H_2O_2 reduces Cl_2 to HCl.

Reason (R) H_2O_2 is called antichlor.

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 fales

D. A is fales but R is true.

Answer: A

Watch Video Solution

7. Assertion (A) In acidic medium, H_2O_2 reacts with MnO_2 to give O_2 .

Reason (R) H_2O_2 is strong oxidising agent.

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 fales

D. A is fales but R is true.

Answer: B

8. Assertion (A) In acidic medium, H_2O_2 reacts with potassium ferricyanide.

Reason (R) H_2O_2 is strong reducing agent.

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 fales

D. A is fales but R is true.

Answer: B

Watch Video Solution

9. Assertion (A) Acidulated water is an example of hard water.

Reason (R) In the presence of an acid, soap is converted into insoluble

free fatty acids.

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 fales

D. A is fales but R is true.

Answer: A

Watch Video Solution

10. Assertion (A) Hydrogen peroxide forms only one series of salts called peroxides.

Reason (R) Hydrogen peroxide molecule has only one replaceable hydrogen atom.

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 fales

D. Both A and R are fales.

Answer: D

View Text Solution

11. Assertion (A) Molar mass of D_2O is more than that of protium oxide.

Reason (R) Boiling point of protium oxide is higher than that of D_2O .

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 fales

D. A is fales but R is true.

Answer: C

View Text Solution

12. Assertion (A): The increasing pressure on water decreases its freezing

point.

Reason (R): The density of water is maximum at 273K.

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 fales

D. A is fales but R is true.

Answer: C

Watch Video Solution

13. Assertion (A) The O-O bond length in H_2O_2 is shorter than that in O_2 .

Reason (R) H_2O_2 is ionic compound.

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 fales

D. Both A and R are fales.

Answer: D



14. Assertion (A): NaCl is less soluble in heavy water than in ordinary water.

Reason (R) : Dielectric constant of ordinary water is more than that of heavy water.

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 fales

D. A is fales but R is true.

Answer: A

Watch Video Solution

1. Hydrogen peroxide can be prepared by action of dil H_2SO_4 or H_3PO_4 on barium peroxide or by bubbling CO_2 through a thin paste of barium peroxide. On industrial scale, it may be prepared by hydrolysis of peroxy disulphuric acid obtained by electrolsis of 50 % H_2SO_4 or equimolar mixture of sulphuric acid and ammonium sulphate. The strength of H_2O_2 can be expressed in various methods say normality, molarity, strength and volume strength. Volume strength means the volume of O_2 produced by decomposition of 1 ml of H_2O_2 . H_2O_2 acts as an oxidising as well as a reducing agent both in acidic and basic media.

Which of the following substance on treatment with H_2O_2 gives MnO_2

A. Acidified $KMnO_4$

B. Alkaline $KMnO_4$

C. Alkaline $MnSO_4$

D. Both B and C.

Answer: D

2. Hydrogen peroxide can be prepared by action of dil H_2SO_4 or H_3PO_4 on barium peroxide or by bubbling CO_2 through a thin paste of barium peroxide. On industrial scale, it may be prepared by hydrolysis of peroxy disulphuric acid obtained by electrolsis of 50 % H_2SO_4 or equimolar mixture of sulphuric acid and ammonium sulphate. The strength of H_2O_2 can be expressed in various methods say normality, molarity, strength and volume strength. Volume strength means the volume of O_2 produced by decomposition of 1 ml of H_2O_2 . H_2O_2 acts as an oxidising as well as a reducing agent both in acidic and basic media.

The correct order of acidity of CO_2 , H_2O and H_2O_2 is

A.
$$CO_2 < H_2O_2 < H_2O$$

- B. $H_2O < H_2O_2 < CO_2$
- ${\sf C}.\, H_2O < H_2O_2 > CO_2$
- D. $H_2O_2 > CO_2 > H_2O$

Answer: B

View Text Solution

3. Hydrogen peroxide can be prepared by action of dil H_2SO_4 or H_3PO_4 on barium peroxide or by bubbling CO_2 through a thin paste of barium peroxide. On industrial scale, it may be prepared by hydrolysis of peroxy disulphuric acid obtained by electrolsis of 50 % H_2SO_4 or equimolar mixture of sulphuric acid and ammonium sulphate. The strength of H_2O_2 can be expressed in various methods say normality, molarity, strength and volume strength. Volume strength means the volume of O_2 produced by decomposition of 1 ml of H_2O_2 . H_2O_2 acts as an oxidising as well as a reducing agent both in acidic and basic media.

Hydrolysis of one mole of peroxodisuphuric acid produces

- A. Two moles of sulphuric acid
- B. Two moles of peroxomonosulphuric acid

C. One mole of sulphuric acid, one mole of peroxomonosulphuphuric

acid

D. One mole of sulphuric acid one mole of peroxomonosulphuphuric

and one mole of hydrogen peroxide.

Answer: C

View Text Solution

4. Hydrogen peroxide can be prepared by action of dil H_2SO_4 or H_3PO_4 on barium peroxide or by bubbling CO_2 through a thin paste of barium peroxide. On industrial scale, it may be prepared by hydrolysis of peroxy disulphuric acid obtained by electrolsis of 50 % H_2SO_4 or equimolar mixture of sulphuric acid and ammonium sulphate. The strength of H_2O_2 can be expressed in various methods say normality, molarity, strength and volume strength. Volume strength means the volume of O_2 produced by decomposition of 1 ml of H_2O_2 . H_2O_2 acts as an oxidising as well as a reducing agent both in acidic and basic media.

100 volumn hydrogen peroxide solution means

A. $17\cdot 86N$

B. $30 \cdot 36 \ \% \ H_2O_2$

 $\mathrm{C.8}\cdot93N$

D. All are correct.

Answer: D

View Text Solution

Matrix Match Type Mcqs

	р		qrs
	A	(
	BO		
	C		
	D	($\mathbf{D}\mathbf{O}\mathbf{O}$
1.			
	Column I		Column II
A	Nascent hydrogen	p	Permutit
B	Hard water	q	$Molecular H_2$ with excess energy
C	Hydrogen peroxide	r	${ m Reduces} FeCl_3 { m to} FeCl_2$
D	Dihydrogen	s	${ m Reduces} Cr_2O_7^-{ m to} Cr^{3+}$

D View Text Solution

Integer Type Questions

1. Number of isotopes of hydrogen are



2. How many of the following oxides would liberate H_2O_2 on treatment with dil. H_2SO_4 ?

 PbO_2 , Na_2O_2 , MnO_2 , BaO_2 , TiO_2 , CO_2 , NO_2 , SnO_2 and Ag_2O .

Watch Video Solution

3. Presence of which of the forcoming compounds makes water hard ?

 $Na_2SO_4, Ca(HCO_3)_2, MgCl_2, Na_2CO_3, CaSO_4, KCl, NaHCO_3, MgSO_4, NaHCO_3, N$

Watch Video Solution

4. How many of the following metals dissolve in boiling alkali to produce

 H_2 gas ?

Cu, Ni, Zn, Be, Ag, Fe, Mn, Sn, Al.

Watch Video Solution

1. Hydrogen can behave as a metal

A. at very high temperature

B. at very low temperature

C. at very high pressure

D. at very low pressure.

Answer: C

Watch Video Solution

2. D_2O is preferred to H_2O , as a moderator, in nuclear reactors because

A. D_2O slows down fast neutrons better

B. D_2O has high specific heat

C. D_2O is cheaper

D. None of these.

Answer: D

Watch Video Solution

3. Out of the two allotropic forms of dihydrogen, the form with lesser molecular energy is

A. ortho

B. meta

C. para

D. All have same energy.

Answer: C

Watch Video Solution
4. With the increases

A. ortho

B. meta

C. para

D. None.

Answer: A

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5. Saline hydrides react explosively with water, such fires can be extinguished by

A. water

B. carbon dioxide

C. sand

D. None of these.

Answer: C

Watch Video Solution

6. Metals of groups 7, 8 and 9 do not form metallic hydrides. This is termed as

A. hydride gap

B. hydride shift

C. anhydride

D. dehydride.

Answer: A

Watch Video Solution

7. When temporary hard water containing $Mg(HCO_3)_2$ is boiled, the ppt.

formed is of

A. $MgCO_3$

B. MgO

 $\mathsf{C}.Mg(OH)_2$

D. None of these.

Answer: C

Watch Video Solution

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

A. $Ca(OH)_2$

B. Na_2CO_3

 $\mathsf{C.} Na_2 CO_3 + Ca(OH)_2$

D. None of these.

Answer: C

9. The element which forms maximum number of compound is

A. carbon

B. hydrogen

C. silicon

D. nitrogen.

Answer: B

Watch Video Solution

10. The most abundant element in the universe is

A. carbon

B. silicon

C. hydrogen

D. helium.

Answer: C



11. Pick out the correct statement

A. By decreasing the temperature pura parahydrogen can be obtained

- B. By increasing the temperature pura orthohydrogen can be obtained.
- C. By decreasing the temperature pura orthohydrogen can be obtained.
- D. By increasing the temperature pura parahydrogen can be obtained.

Answer: A

12. Hydrogen can be produced by heating

A. Cu with H_2SO_4

B. Sodium formate

C. Sodium oxalate

D. None of these.

Answer: B

Watch Video Solution

13. Plumbosolvency is a health hazard in the transporatatino of

A. hard water only

B. soft water only

C. Both (A) and (B)

D. Water containing plum juice.

Answer: B Watch Video Solution 14. A sample of water contains sodium chlorde. It is A. hard water B. soft water C. moderately hard D. None. Answer: B

Watch Video Solution

15. Hardness producing salt, whose solubility in water decreases with rise

of temperature is

A. $CaCl_2$

 $\mathsf{B.}\, CaSO_4$

 $C.Ca(HCO_3)_2$

 $\mathsf{D.}\, MgSO_4.$

Answer: B

Watch Video Solution

16. A sample of water containing some dissolved table sugar and common salt is passed through organic ion exchange resins. The resulting water will be

A. testeless

B. sweet

C. salty

D. None of these.

Answer: B



17. Metal(s) generally obtained by the reduction of their oxides with H_2

are

A. Al, Zn

B. Mo, W

C. Na, K

D. Ca, Mg.

Answer: B

View Text Solution

18. Raney nickel, the commonly used catalyst for hydrogenation is

obtained by

A. grinding Ni-Al alloy

B. treating Ni-Al alloy with NaOH

C. treating Ni-Al alloy with dil. H_2SO_4

D. treating $NiSO_4$ with NaOH.

Answer: B



19. Presence of water can be tested with

A. anhydrous $CuSO_4$

B. anhydrous $FeSO_4$

C. anhydrous Na_2CO_3

D. None of these

Answer: A



20. Water obtained by purification with organic ion exchange resins is

A. pure water

B. free from only Ca^{2+}, Mg^{2+} ions

C. free form HCO_3^- , SO_4^{2-} and Cl^- ions only

D. None of these.

Answer: D

Watch Video Solution

21. Which of the following can effectively remove all types of hardness of

water?

A. Soap

B. Washing soda

C. Slaked lime

D. None of these.

Answer: A

Watch Video Solution

Brain Teasers 16

1. Temperature of maximum density in H_2O and D_2O respectivelt are

A. $277 \cdot 15K$, $284 \cdot 75K$

B. $273 \cdot 15K$, $277 \cdot 15K$

C. $277 \cdot 15K$, $285 \cdot 75K$

D. $284 \cdot 75K$, $277 \cdot 15K$.

Answer: A

2. Non-metallic oxides dissolve in water to from

A. acidic solution

B. alkaline solution

C. neutral solution

D. None of these.

Answer: A

Watch Video Solution

3. Ordinary water is not used as a moderator in nuclear reactors because

A. it cannot slow down fast moving neutrons

B. it cannot remove the heat from the reactor core

C. it absorbs the fast moving neutrons

D. of its corrosive action on metallic parts of the nuclear reactor.

Answer: C

Watch Video Solution

4. Which of the following can effectively remove all types of hardness of

water ?

A. Washing soda

B. Soap

C. Slaked lime

D. Boiling.

Answer: B

Watch Video Solution

5. Hydrogen behaves as a metal

A. at low temperature

B. at high temperature

C. at low pressure

D. at high pressure.

Answer: D

Watch Video Solution

6. With the decrease in temperature, the proportion of which allotropic

form increases

A. ortho

B. para

C. meta

D. heavy hydrogen.

Answer: B

7. A sample of water contains sodium chlorde. It is

A. hard water

B. soft water

C. moderately hard

D. None.

Answer: B

Watch Video Solution

8. Brackish water mostly contains

A. calcium chloride

B. barium sulphate

C. sodium chloride

D. mineral acids.

Answer: C



Watch Video Solution

10. Solubility of calcium sulphate in water

A. increases with increases in temperature

B. decreases with increases in temperature

C. remains unaltered with rise of temperature

D. does not follow any definite pattern with rise of temperature.

Answer: B

Watch Video Solution

11. The volumn strength of perhydrol is

A. 20

B. 30

C. 100

D. 10 .

Answer: C

12. The solubility of an ionic compound is compared in heavy and simple water. It is

A. higher in heavy water

B. lower in heavy water

C. same in heavy water and simple water

D. lower in simple water.

Answer: B

Watch Video Solution

13. Which of the following cannot be oxidised by H_2O_2 ?

A. PbS

 $\mathsf{B.}\,O_3(g)$

 $\mathsf{C.}\,Na_2SO_3(aq)$

D. KI(aq).

Answer: B



14. Which subtance cannot be reduced by H_2O_2

A. Ag_2O

- B. $Fe_{(3+)}$
- C. Acidified $KMnO_4$
- D. Acidified $K_2Cr_2O_7$.

Answer: B



15. Hydrogen can be prepared by the action of dil. H_2SO_4 on

A. copper

B. iron

C. lead

D. mercury.

Answer: B

Watch Video Solution

16. The element whose hydride contains maximum number of hydrogen per atom of the element is

A. Na

B. O

С. В

D. Si.

Answer: D

17. Indicator type silica gel used as a dehumidifier contains

A. Cu^{2+} ions B. Ni^{2+} ions C. Co^{2+} ions D. Fe^{2+} ions

Answer: C

Watch Video Solution

18. To an aqueous solution of $AgNO_3$ some NaOH(aq) is added, till a brown ppt is obtained. To this H_2O_2 is added dropwise. The ppt turns black with the evolution of O_2 . The black ppt is

A.
$$Ag_2O$$

B. Ag_2O_2

 $\mathsf{C.}\,AgOH$

D. None of these

Answer: D

Watch Video Solution

19. Atomic hydrogen reacts with oxygen to give

A. almost pure water

B. almost pure hydrogen peroxide

C. a mixture of water and hydrogen peroxide

D. None of these.

Answer: B

20. Which of following cannot be used for the preparation of H_2 ?

A. Zn + HCl(dil.)
ightarrow

B. $NaH + H_2O \rightarrow$

C.
$$Zn + HNO_3(dil.~)
ightarrow$$

D. $HCOONa \xrightarrow{\Delta}$

Answer: C

Watch Video Solution

Unit Test li

1. Which metal can produce dihydrogen gas by reaction with dil H_2SO_4 ?

A. Ag

B. Cu

C. Fe

D. Pt.

Answer: C



2. In which property listed below hydrogen does not resemble alkali metals ?

A. Tendency to form cation

B. Nature of oxide

C. Combination with halogens

D. Reducing character.

Answer: B

3. In which of the properties listed below hydrogen does not show resemblance with halogens ?I Electropositive character

II Electronegative character

III Neutral nature of H_2O

IV. Atomicity

A. I and III

B. I only

C. II and III

D. III and IV.

Answer: A



4. Which isotope of hydrogen is/are radioactive in nature ?

A. Protium and deuterium

B. Tritium only

C. Tritium and deuterium

D. Only deuterium.

Answer: B

Watch Video Solution

5. In which of the following reactions does dihydrogen act as oxidising agent ?

A. $Ca+H_2
ightarrow$

 $\mathsf{B.}\,H_2+O_2\rightarrow$

 $\mathsf{C}.\,H_2+F_2\rightarrow$

D. $CuO+H_2
ightarrow$

Answer: A

6. Out of the oxides given below, which of them cannot be reduced by H_2

I (Al_2O_3) ,II (CuO), (III)(ZnO)

A. only I

B. I and II

C. I,II, and III

D. III and II.

Answer: A

View Text Solution

7. Which type of elements form ionic hydrides hydrides

A. Transition elements

B. Matalloids

- C. Elements with high electronegativity
- D. Elements with high electropositivity.

Answer: D

Watch Video Solution

8. The three isotopes of hydrogen differ from one another in

A. Atomic number

B. Number of protons

C. Nuclear charge

D. Nuclear mass.

Answer: D

9. Aluminium reacts with boiling water to liberate dihydrogen gas along with the formation of

A. Aluminium oxide

B. aluminium hydroxide

C. aluminium suboxide

D. aluminium superoxide.

Answer: A

Watch Video Solution

10. Lithium silicide reacts concentrated hydrochloric acid to give lithium

chloride along with

A. H_2 and Si

B. SiH_4 gas

C. disilane gas

D. Si_3H_8

Answer: C



11. In the laboratory preparation of hydrogen, pure zinc is not used because

A. Pure zinc becomes passive due to the formation of oxide layer

B. pure zinc becomes passive due to the formation of sulphate layer

over the metal

C. pure zinc reacts slowly with the acid

D. pure acid reacts with the acid vigorously.

Answer: C

12. Which combination cannot be used for the preparation of hydrogen

gas in the laboratory ?

I. Zinc/conc. H_2SO_4

II. Zinc/ HNO₃

III. Pure zinc/dil. H_2SO_4

A. I and II

B. I, II, III

C. III only

D. I and III.

Answer: B

Watch Video Solution

13. Hydrogen gas is not obtained when zinc reacts with

A. cold water

B. dil H_2SO_4

C. dil HCl

D. hot 20~% NaOH solution.

Answer: A

Watch Video Solution

14. Heavy water finds application in atomic reactor as

A. coolant

B. Moderator

C. both coolant and moderator

D. Neither coolant nor moderator.

Answer: C

15. Heavy water is so called because

A. it is highly dense and viscous

B. it is an oxide of heavier isotope of hydrogen

C. it is as heavy as mercury

D. its formula is D^2O

Answer: B

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16. When hard water is passed through ion exchange resin with formula

 $RNH_3^+OH^-$ it becomes free from

A. $Ca^{2+}ion$

B. all cations

C. all anions

D. all types of ions.

Answer: C



17. Which of the following operations would cause removal of temporary

hardness of water ?

A. passing CO_2 gas through is

B. passing SO_2 gas through is

C. adding calculated amount of $Ca(OH)_2$

D. adding calculated amount of sodium hypophosphate.

Answer: C



18. A clear transparent liquid is taken in a glass. Which of the following

will provide clue whether it is water or not

A. Adding a litmus paper

B. Adding few drops of liquid over potassium chloride

C. Adding a few drops of liquid over anhydrous copper sulphate

D. Tasting and smelling of liquid.

Answer: C

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19. The maximum tolerable limit of degree of hardness in water required

for our daily needs is approximately

A. 10-15 ppm

B. 100-150 ppm

 $C. 10^3 \text{ ppm}$

D. 700-800 ppm.

Answer: B
20. The formula of sodium zeolite which is used in permutit process for softening water is

A. $Na_2OAl_2O_3Si_2O_4xH_2O$

 $\mathsf{B.}\, Na_2Al_2Si_2O_4xH_2O$

C. $Na_2OAlO_3SiO_4xH_2O$

D. $K_2Al_2SiO_8xH_2O$.

Answer: A

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21. In permutit process, the exhausted resin is generally regenerated by

percolating through it the solution of

A. Sodium chloride

B. Calcium chloride

C. Magnesium chloride

D. equimolar mixture of $CaCl_2$ and $MgCl_2$.

Answer: A

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22. The structure of hydrogen peroxide molecule is

A. linear

B. half open book like

C. closed book like

D. cyclic.

Answer: B

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23. Which of the following suppresses the decomposition of H_2O_2

A. MnO_2

B. Finely divided metals

C. Acetanilide

D. Dust particles.

Answer: C

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24. In the Marck's process the reagents involved for the preparation of

hydrogen peroxide are

A. BaO_2, HCl

 $\mathsf{B.}\, Na_2O_2,\, H_2SO_4$

 $\mathsf{C}.\,BaO_2,\,H_3PO_4$

 $\mathsf{D}. \ PbO_2, \ H_2O.$

Answer: B



25. What is true H_2O_2 ?

A. It is colourless, syrupy liquid in pure state

B. It is colourless and has a flat taste

C. It is smells like nitric acid

D. It is appreciably soluble in ether and alcohol.

Answer: A,B,D

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26. The bleaching properties of hydrogen peroxide is due to its

A. acidic nature

B. ability to liberate nascent oxygen

C. reducing nature

D. ability to liberate nascent hydrogen.

Answer: A

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27. During concentration of hydrogen peroxide, the removal of last traces

of water from $99~\%~H_2O_2$ is carried out by

A. vacuum distillation

B. placing in a vacuum desiccator

C. cooling in a freezing mixture

D. slow evaporation in sun.

Answer: C

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28. When H_2O_2 is added to ice cold solution of acidified potassium dichromate containing ether. The contents are shaken allowed to stand, then

A.a blue colour is obtained in ether due to the formation of $Cr_2(SO_4)_3$

B. a blue colour is obtained in ether due to the formation of CrO_5

C. CrO_3 is formed which dissolves in ether to give blue colour

D. Chromyl chloride is formed.

Answer: A

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29. Which of the following species is reduced by H_2O_2

A. $\left|Fe(CN)_6\right|^4$

B. $\left|Fe(CN)_6\right|^{3-}$ in alkaline medium

 $\mathsf{C}.NO_2^-$

D. I^{-}/HCl .

Answer: B

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30. In which of the solution hydrogen peroxide neither acts as oxidising

agent nor reducing agent ?

A.
$$Na_2CO_3+H_2O_2
ightarrow$$

 ${\rm B.}\, PbS+H_2O_2 \rightarrow$

C.
$$Cr_2O_7^{2-} + H^+ + H_2O_2
ightarrow$$

D.
$$SO_{3}^{-} + H_{2}O_{2}$$

Answer: A

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31. The volume of 10 vol H_2O_2 required to liberate 500 cm^3 of O_2 at STP

A. 50 ml

 $\mathrm{B.5}\cdot 0ml$

C. 15 ml

D. 100 ml.

Answer: A

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32. H_2O_2 can act as

A. acid only

B. oxidant only

C. reductant only

D. acid, reductant as well as oxidant.

Answer: D
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Concept Base Questions
1. Hydrogen is reagarded as a rogue elements in the periodic table. Explain
Watch Video Solution
Hots
1. Answer the following:
(a) Both conc. HCl and conc. H_2SO_4 cannot be used to preapre hydrogen

gas by reacting with zinc metal.

(b) Pure zinc metal cannot be used for preparing hydrogen gas.

(c) Moist hydrogen connot be dried by passing through conc. H_2SO_4 .

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Additional
1. When a small dry piece of sodium metal is throw in water, it immediately fire. What actually happens
Short
1. Water molecule is bent and not linear in structure. Explain.
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3. Why does hydrogen occur in diatomic form rather than in monoatomic

form under normal conditions?

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4. How can the production of dihydrogen from 'coal gasification' be
increased?
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5. Describe the bulk preparation of dihydrogen by electrolytic method. What is the role of an electrolyte in the processgt
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6. Complete the following

$$\text{(i)} \ H_2(g) + MnOo(s) \stackrel{\text{heat}}{\longrightarrow} \text{(ii)} \ CO_2(g) + H_2(g) \stackrel{\text{heat}}{\underset{\text{catalyst}}{\longrightarrow}}$$

(iii)
$$C_3H_8(g)+3H_2O(g) \xrightarrow[ext{catalyst}]{ ext{ heat}}$$
 (iv) $Zn(s)+NaOH(aq) \xrightarrow[ext{ heat}]{ ext{ heat}}$

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7. Describe the conseuences of high bond enthalpy of H-H bond in terms

of chemical reactivity of digydrogen.

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8. What do you understand by (i) electron deficien t(ii) electron precise and (iii) electron rich compounds of hydrogen? Provide justification with sutable examples

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9. What characteristics do you expect from an electron deficient hydride with respect to its structure and chemical reaction?

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10. Do you expect the carbon hydride of the type (C_nH_{2n+2}) to act Lewis acid or base? Justify you answer.

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11. What do you understand by the term non stoichiometric hydrides? Do you expect these types of hydries t be formed from alkali metals? Justify answer.

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12. How would you expect the metallic hydrides to be useful storage?

Explain

View Text Solution

13. How does atomic hydrogen or oxy-hydrogen toch function for cutting

and welding purposes? Explain.

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14. Among NH_3 , H_2O and HF, which would you expect to have highest magnitude of hydrogen bonding and why?

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15. Saline hydrides are known to react violently with water producing fire,

Can CO_2 , a well known extinguisher, be used in this case? Explain.

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16. Arrange the following:

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



20. Complete the following

(i)
$$PbS(s) + H_2O_2(aq) \rightarrow$$
 (ii) $MnO_4^-(aq) + H_2O_2(aq) + H^+(aq) \rightarrow$
 $CaO_s + H_2O(g) \rightarrow$ (iv) $AlCl_3(s) + H_2O(l) \rightarrow$
(v) $Ca_3N_2(s) + H_2O(l) \rightarrow$

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21. Describes the structure of common form of ice.

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22. What causes temporary and permanent hardness of water?



23. Discuss the principle and method of softening of hard water by

synthetic ion exchange method.





how can it be made useful?



28. What properties of water make it useful as a solvent? What types of

compound can it (i) dissolve and (ii) hydrolyse?

D Watch Video Solution

29. Describe the usefulness of water in bioshphere and biological systems.

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30. Knowing the properties of H_2O and D_2O , do you think that D_2O

can be used for drinking purposes?

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31. Hydrolysis is different from hydration. Elaborate.



33. What do you except the nature of hydrides if formed by the elements

of atomic number of 15,9,23,44 with dihydrogen?

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34. Do you expect different products in solution when aluminium (III) chloride and potassium chloride treated separately with (a) normal water, (b) acidified water and (c) alkaline water? Write equations wherever necessary.



factors are responsible. Of the following factors which one is most important in this respect ?

A. Its tendency to lose an electro to form a cation.

B. Its tendency to gain a single electron in its valence shell to attain

stable electronic configuration.

C. It low negative electron gain enthalpy value.

D. It is small size.

Answer:



38. Why does H^+ ion always get associated with atoms or molecules ?

A. lonisation enthalpy of hydrogen resembles that of alkali metals.

B. Its reactivity is similar to halogens

C. It is resembles both alkali metals and halogens.

D. Loss of an electon from hydrogen atoms results in an nucleus of

very small size as compared, to other atoms or ions. Due to small

size it cannot exist free.

Answer:

39. Metal hydrides are ionic, covalent or molecular in nature. Among LiH, NaH, KH, RbH, CsH the correct order of increasing ionic character is

A. LiH > NaH > CsH > KH > RbH

 $\mathsf{B}.\,LiH < NaH < KH < RbH < CsH$

 $\mathsf{C.}\, RbH > CsH > NaH > KH > LiH$

 $\mathsf{D}. \, NaH > CsH > RbH > LiH > KH$

Answer:

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40. Which of the following hydrides is electron-precise hydride ?

A. B_2H_6

 $\mathsf{B.}\,NH_3$

 $\mathsf{C}. H_2 O$

D. CH_4

Answer:



41. Radioactive elements emit α , β and γ rays and are characterised by their half-lives. The radioactive isotope of hydrogen is

A. Protium 0

B. Dueteirum

C. Tritium

D. Hydronium

Answer:

Watch Video Solution

42. Cosider the reactions

(i) $H_2O_2+2HI
ightarrow I_2+2H_2O$

(ii) $HOCl + H_2O_2
ightarrow H_3O^+ + Cl^- + O_2$

Which of the following statements is correct about H_2O_2 with reference

to these reactions ? Hydrogen peroxide is ………

A. an oxidising agent in both A and B

B. an oxidising agent in (A) and reducing agent in (B)

C. a reducing agent in (A) and oxidising agent in (B)

D. a reducing agent in both (A) and (B)

Answer:

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43. The oxide that give H_2O_2 on treatment with dilute H_2SO_4 is

A. PbO_2

 $\mathsf{B.}\,BaO_2$

 $\mathsf{C}.MnO_2$

D. TiO_2

Answer:



44. Which of the following equations depict theoxidising nature of H_2O_2 ? A. $2MnO_4^- + 6H^+ + 5H_2O_2 o 3Mn^{2+} + 8H_2O + 5O_2$

 ${\rm B.}~2Fe^{3\,+}~+~2H^{\,+}~+~H_2O_2~\rightarrow~2Fe^{2\,+}~+~2H_2O~+~O_2$

C. $2l^-+2H^++H_2O_2
ightarrow 2H_2O$

D. $KIO_4 + H_2O_2 \rightarrow KIO_3 + H_2O + O_2$

Answer:

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45. Which of the following equation depicts reducing nature of H_2O_2 ?

A.
$$2[Fe(CN)_6]^{4-} + 2H^+ + H_2O_2 \rightarrow 2[Fe(CN)_6]^{3-} + 2H_2O$$

B. $I_2 + H_2O_2 + 2OH^- \rightarrow 2I^- + 2H_2O + O_2$
C. $Mn^{2+} + H_2O_2 \rightarrow Mn^{4+} + 2OH^-$
D. $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

Answer:

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46. Hydrogen peroxide is

A. an oxidising agent

B. a reducing agent

C. both an oxidising and a reducing agent

D. neither oxidising nor reducing agent

Answer:



47. Which of the following reaction increase production of dihydrogen from synthesis gas ?

$$\begin{array}{l} \mathsf{A.} \ CH_4(g) + H_2O(g) \xrightarrow[Ni]{1270K} CO(g) + 3H_2(g) \\ \\ \mathsf{B.} \ C(s) + H_2O(g) \xrightarrow[1270]{1270} CO(g) + H_2(g) \\ \\ \mathsf{C.} \ CO(g) + H_2O(g) \xrightarrow[\operatorname{673K}]{\operatorname{Catalyst}} CO_2(g) + H_2(g) \\ \\ \\ \mathsf{D.} \ C_2H_6 + 2H_2O \xrightarrow[Ni]{1270K} 2CO + 5H_2 \end{array}$$

Answer:



48. When sodium peroxide is trated with the dilute sulphuric acid, we

get……..

- A. sodium sulphate and water
- B. sopdium sulphate and oxygen
- C. sodium sulphate, hydrogen and oxygen
- D. sodium sulphate and hydrogen peroxide

Answer:

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49. Hydrogen perioxde is obtained and hydrogen peroxide

A. water

B. sulphuric acid

C. hydrochloric acid

D. fused sodium peroxide

Answer:

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50. Which of the following reactiona is an example of use of water gas in the synthesis of other compounds?

$$\begin{array}{l} \mathsf{A.} CH_4(g) + H_2O(g) \xrightarrow[Ni]{1270K} CO(g) + H_2(g) \\ \\ \mathsf{B.} CO(g) + H_2O(g) \xrightarrow[\operatorname{Catalyst}]{673K} CO_2(g) + H_2(g) \\ \\ \mathsf{C.} C_nH_{2n+2} + nH_2O(g) \xrightarrow[Ni]{1270K} nCO + (2n+1)H_2 \\ \\ \\ \mathsf{D.} CO(g) + 2H_2(g) \xrightarrow[\operatorname{Cobalt}]{Catalyst}} CH_3OH(l) \end{array}$$

Answer:

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51. Which of the following ions will cause hardness in water sample?

A. Ca^{2+}

B. Na^+

 $\mathsf{C}.\,Cl^{\,-}$

Answer:



52. Which of the following compounds is used for water softening ?

A. $Ca_3(PO_4)_2$

B. Na_3PO_4

 $C. Na_6 P_6 O_{18}$

D. Na_2HPO_4

Answer: C



53. Elements of which of the following group(s) of periodic table do not

form hydrides?

A. Groups 7,8,9

B. Group 13

C. Groups 15,16,17

D. Groups 14

Answer:

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54. Only one element of …….from hydride.

A. Groups 6

B. Group7

C. Group 8

D. Group 9

Answer:

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55. Which of the following statements are not true for hydrogen ?

A. It exists as diatomic molecule.

B. It has one electron in the outermost sheell.

C. It can lose an electron to form a cation which can freely exist

D. It forms a large number of ioninc compounds by losing an electron

Answer:



56. Dihydrogen can be perpared on commerical scale by different methods. In its prepration by the action of steam on hydrocarbons , a mixture of CO and H_2 gas is formed. It is know as $\hat{a} \in \hat{a} \in \hat{a}$

A. Water gas

B. Syn gas

C. Producer gas

D. Industrical gas

Answer:

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57. Which of the following statement(s) is/are correct in the case of heavy

water ?

A. Heavy water is used as a moderator in nuclear reactor.

B. Heavy water is more effective as solvent than ordinary water.

C. Heavy water is more associated than ordinary water.

D. Heavy water

Answer:

58. Which of the following statements about hydrogen are corrent?

- A. Hydrogen has three isotopes of which protium is the most common.
- B. Hydrogen never acts as cation in ionic salts.
- C. Hydrogen ion H^+ , exists freeely in solution.
- D. Dihydrogen does not act as a reducing agent.

Answer:

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59. Some of the properties of water are described below. Which of the is

/are not correct ?

A. Water is known to be a universal solvent.

B. Hydrogen bonding is present to a large extent in liquid water.

C. There is no hydrogen bonding in the frozen state of water.

D. Frozen wter is heavier than liquid water.

Answer:

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60. Hardness of water may be tempoarary or permanent .Permanent

hardness is due to the presence of

A. Chlorides of Ca and Mg in water

B. Sulphates of Ca and Mg is water

C. Hydrogen carbonates of Ca and Mg in water.

D. Carbonates of alkali metals in water.

Answer:
61. Which of the following statements is correct?

A. Elements of group 15 forms electron difficient hydrides.

B. All elements of group 14 form electron precise hydrides.

C. Electron precise hydrides have tetrahedral geometries.

D. Electron rich hydrides can act as Lewis acids.

Answer:

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62. Which of the following statements is correct?

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63. Which of the following statement is correct?

A. Metallic hydrises are deficient of hydrogen

B. Metallic hydrides conduct heat and electricity.

C. Ionic hydrides do not conduct heat and electricity,

D. Ionic hydrides are very good conductors of electricity in solid stae.

Answer:

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64. Correlate the items listed in column I with those listed in column II.

Find out as many corrlation as you can.

	Column I		Column II
Α.	Synthesis gas	1.	Na ₂ [Na ₄ (PO ₃) ₆]
В.	Dihydrogen	2.	Oxidising agent
C.	Heavy water	3.	Softening of water
D.	Calgon	4.	Reducing agent
E.	Hydrogen peroxide	5.	Stoichiometric compounds of s-block elements
F	Salt like hydrides	6.	Prolonged electrolysis of water
	,	7.	Zn + NaOH
		8.	$Zn + dil. H_2SO_4$
		9.	Synthesis of methanol
		10.	Mixture of CO and H ₂

65. Match Column I with Column II for the given properties/ applications

mentioned therein.

	Column I	Column ll		
Α.	Н	1.	used in the name of perhydrol.	
Β.	H_2	2.	can be reduced to dihydrogen by NaH.	
C.	H ₂ O	3.	can be used in hydroformylation of olefin.	
D.	H_2O_2	4.	can be used in cutting and welding.	



66. Match the items in Column I with the relevant item in column II.

	Column I		Column II
Α.	Hydrogen peroxide is used as a	1.	zeolite
Β.	Used in Calgon method	2.	perhydrol
C.	Permanent hardness of hard water is removed by	3.	sodium hexametaphosphate
		4.	propellant



67. In the following quesitons a statement of Assertion (A) followed by a statement of reason (R) is given. Choose the correct option out of the option given below each question.

Assertion[A]: Permanent hardness of water is removed by treatment with washin soda.

Reason[R]: Washing soda reacts with soluble magneisum and calcium sulphate to form insoluble carbonates.

A. Statements A and R both are correct and R is the correct explanation of A.

B. A is correct but R is not correct.

C. A and R both are correct but R is not the correct explanation of A.

D. A and R both are false.

Answer:

68. Assertion (A) Some metals like platinum and palladium, can be used as storage media for hydrogen.

Reason (R) Platnium and palladium can absorb large volumes of hydrogen.

A. Statements A and R both are correct and R is the correct

explanation of A.

B. A is correct but R is not correct.

C. A and R both are correct but R is not the correct explanation of A.

D. A and R both are false.

Answer:

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69. How can production of hydrogen from water gas be increased by

using water gas shift reaction ?

70. What are metallic or interstitial hydrides? How do they differ from

molecular hydrides?

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71. Name the classes of hydrides to which H_2O , B_2H_6 and NaH belong.

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72. If same mass of liquid water and a piece of ice is taken, then why is the

density of ice less than that of liquied water ?



73. Complete the following equations

(i) $PbS(s) + H_2O_2(aq)
ightarrow$

(ii) $CO(g)+2H_2(g) \xrightarrow{ ext{cobalts}}$



74. Given reasons

(i) Lakes freeze form top towards bottom.

(ii) Ice floats on water.

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75. What do you understand by the term 'auto protolysis of water'? What

is the significance?

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76. Dicuss briefly de- mineralistion of water by ion exchange resin.

77. Moleular hydrides are classified as electron deficient, electron precise

and electron rich compounds. Explain each type with two examples.

Watch Video Solution	
78. How is heavy water prepared? Compare its physical properties with those of ordinary water.	
Watch Video Solution	
79. Write one chemical reactions for the preparation of D_2O_2 .	
Watch Video Solution	

80. The volume strength of $1\cdot 5$ N H_2O_2 solution is

81. (i) Draw the gas phase and solid phase structure of H_2O_2 .

(ii) H_2O_2 is a better oxidising agnet than water . Explain .



82. Melting point, enthaply of vaporisation and visvocsity data of H_2O

and D_2O is given below

	H ₂ 0	D ₂ O
Melting point/K	373.0	374.4
Enthalpy of vaporisation at (373 K)/kJ mol ⁻¹	40.66	41.61
Viscosity/centipoise	0.8903	1.107

On the basis of the data explain in which of these liqiuds intermolecular

forces are stronger?



83. Dihydrogen reacts with dioxygen (O_2) to from water .Write the name and formule of the product when the isotope of hydrogen which has one proton and one neutron in its nucles is treated with oxygen. Will the reactivity of both the isotopes be the same towards oxygen ? Justify your answer.

84. Explain why HCl is a gas and HF is a liquid ?

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85. When the first element of the periodic table is treated with dioxgyen , it gives a compound whose soilds state floats on its liquid state. This compound has an ability to act as an well as a base. What products will be formed when this compound undergoes autoionsation?

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86. Rohan heard that instructions were given to the laboratory attendent to store a particular chemical, i.e., keep it in the dark room,add some urea

in it, and keep it away keep form dust. This chemical acts as an oxidising as well as a reducing agent in both acidic and alkaline media. This chemical is important for use in the pollution contral teratment of domestic and industrial effluents.

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87. Given reason why hydrogen resembles alkali metals?

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88. Hydrogen generally form covalent compounds. Give reason



89. Why is the ionisation enthalpy of hydrogen higher than that of sodium ?

90. Basic pricinple of hyrogen economy is transpotation and storage of enery in the form of liquid or gaseous hydrogen. Which property of hydrogen may be useful for this purpose ? Support your answer with the chemical equations if required.

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91. What is the importance of heavy water ?

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92. Write the Lewis structure of hydrogen peroxide .

93. An acidic solution of hydrogen peroxide behaves as an oxidising as well as reducing agent. Illustrate it with the help of a chemical equation.

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94. With the help of suitable examples, explain the property of H_2O_2 that
is responsible for its bleaching action ?
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95. Why is water molecule polar?

Watch Video Solution

96. Why does water show high boling points as compared to hydrogen

sulphide? Given reason for answer.

97. Why can dilute solutions of hydrogen peroxide not be concentrated by heating? How can a conentrated solution of hydrogen peroxide be obtanied ?

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98. Why is hydrogen peroxide stored in wax lined bottles?	
Watch Video Solution	
99. Why does hard water not from lather with soap ?	
Watch Video Solution	
100. Phosphoric acid is perferred over sulphuric acid in perparing hydrogen peroxide form peroxides. Why ?	



105. How can D_2O_2 prepared form water ? Mention the physcial properties in which D_2O differs from H_2O . Given at least three reaction of D_2O showing the exchange of hydrogen with deuterium.

106. How will you concentrate H_2O_2 ? Show difference between structures of H_2O_2 and H_2O by darwing their spatial structures . Also mention three important uses of H_2O_2 .



107. Give a method for the manufacture of hydrogen peroxide and explain the reactions involved therein .

(ii) Illustrate oxidising, reducing and acidic properties of hydrogen peroxide with equations.

108. (i) What mass of hydrogen peroixde will be present in 2 L of a 5 molar

solution ?

(ii) Caluclate the mass of oygen which will be liberated by the decomposition of 200 mL of this solution.

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109. A colourless liquid. 'A' contains H and O elements only. It decomposes on exposure to light. It is stablished by mixing urea to store in the presence of light.

(i) Suggest possible structure of A.

(ii) Write chemical equation for its decompositions reaction by light.



110. An ionic hydride of an alkali metal has significant covalent character and is almost unreactive towards oxygen and chlorine . This is used in the synthesisi of other useful hydrides. Write the formula of this is used in the synthesis of other hydrides. Write the formula of this hydride. Write its reaction with Al_2Cl_6 .

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111. Sodium forms a crystallisation ionic solid with dihydrogen. The solid is non-conducting in nature. It reacts violently with water to produce dihydrogen gas. Write the formula of this compond and its reaction with water. What will happen on electrolysis of the melt of this solid.

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112. Elements hydrogen reacts with other substances only slowly at room temperature. Why?



113. Give one example of a reaction in which dihydrogen as a reducing

agent and an oxidising agent.



114. Why is dihydrogen not preferred in weather balloons these days?



115. Account for the following in the preparation of H_2O_2 from barium perioxide (BaO_2) and dilute H_2SO_4 .

(a) A thin paste of hydrated barium perioxde is used instead of nahydrous perioxide.

- (b) The temperature of the reaction mixture is kept at $0^{\circ}C$.
- (c) The final solution must be kept slightly acidic.

116. The presence of water is avoided in the preparation of H_2O_2 from

 Na_2O_2 . Assign reason.

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117. Explain the following:

(i) Temporary hard water becomes soft on boiling.

(ii) Water can extinguish most fires but not petrol fire.

(iii) Hard water is softened before being used in boilers.

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118. Hydrogen perioxide is used to restore the colour of old oil painting lead oxide. Explain.



119. Why are the melting and boiling points of heavy water more than

those of ordinary water?

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120. A mixture of hydrazine, hydrogen and Cu(II) catalyst is used as rocked

fuel. Why?

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121. It is possible to remove completely the temporary hardness due to

 $Mg(HCO_3)$ by boiling?



122. It is correct to say that hydrogen can behave as metal? State the

condition under which such behaviour is possible.



123. Elements with atomic number 17 and 20 from compounds with hydrogen. Write the formulae of the two compounds and compare their chemical behaviour in water.

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124. Compare the chemical properties of H_2O and H_2O_2 .

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125. What are the advantages of using hydrogen as a fuel?

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126. Why is ice less denser than water and what kind of attractive force

must be overcome to melt ice?

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127. Explain why phosphotric acid is preferred to sulphuric acid in preparation of H_2O_2 from hydrated barium perioxide.

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128. Hydrogen perioxde acts both as an oxidising agent and as reducing

agent in alkaline solution towards certain first row transition metal ions.

liustrate both these properties of H_2O_2 using chemical equation.



129. Water cannot be used to extinguish petrol fire. Explain.



130. A metal (M) produces a gas(N) on reacting with alkalies like NaOH and KOH. Same gas is produced when the metal reacts with dilute sulphuric acid. Gas(N) reacts with another toxic gas (P) to form methonol at high temperature and pressure. (N) also reacts with metals like (Q) to form electrovalent hydrides. Identify M,N,N and Q.

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131. Suggest a method to separate the two allotropic forms of hydrogen.

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132. Calcium burns in nitrogen a white solid which sufficient water to produce a gas (A) and an alkaline solution. The solution o nexposure to air produces a solid layer of (B) on the surface. Identify the compound (A) and (B).

133. A white solid is either Na_2O or Na_2O_2 . A piece of red litmus turns white when it is dipped into freshly prepared aqueous solution of the white solid. Identify the substance and explain with the help of balanced equation what would happen to the red litmus if the white solid were the other compound.



134. The process 1/2 $H_2(g) + e^- o H^-(g)$ is endothermic $(\Delta H = +151 k Jmol^-)$, still ionic hydrides are known. How do you accound for this:



135. Hydrogen forms comound with elements having atomic number 9,11,12 and 17. Write their chemical formulate.



139. What is nascent hydrogen?



143. Explain why is hydrogen peroxide stored in colured/plastic bottles?





144. What is hydride gap?



145. Is the present position of hydrogen in the periodic table satisfactory?

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146. Give a test to detect the presence of water.

D View Text Solution

147. What is the significance of the term '15 volume' H_2O_2 solution

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148. Name the two allotropic forms of hydrogen. Which is more abundant?

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149. Give one example of a reaction in which dihydrogen as a reducing agent and an reducing agent.

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150. Give two example of each of ionic and covalent hydrides.

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151. Name two compounds which retard decomposition of hydrogen peroxide

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152. What is demineralised water? How is if formed?



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155. Give two points of similarity between hydrogen (H_2) and chlorine (Cl_2)

156. Water cannot be used to extinguish petrol fire. Explain.

Watch Video Solution
157. What happens when H_2O_2 is treated with (i) Acidified potassium (ii) Lead sulphide.
Watch Video Solution
158. (a) How does H_2O behave as a bleaching agent?

(b) What causes temporary and permanent hardness of water?



159. How does hydrogen peroxide behave in the reaction with KIO_4





167. One litre of a sample of hard water contains 1 mg of $CaCl_2$ and 1 mg of $MgCl_2$. Find the total hardness of water in terms of parts of $CaCO_3$ per 10^6 parts of water by mass.

168. A $5.0cm^3$ solutions of H_2O_2 liberates of 0.508g of iodine from acidified KI solution. Calculate the volume strength of H_2O_2 at N.T.P.

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169. Hydrogen is the first element in the perodic table and is also the highest element known. Molecular hydrogen is best prepared by the electrolysis of water containing a small amount of acid or alkali. It is also a constituent of water gas $(CO + H_2)$ known as syn gas. Hydrogen is releatively inert at room temperatrure due very high bond dissociatin enthalpy $(430.0kJmol^{-1})$ of H-H bond.

- (i) Why does hydrogen act as a powerful reducing agent?
- (ii) How does hydrogen cause of unsaturated hydrocarbons?
- (iii) Hydrogen- oxygen fuel are used for generating electrical energy. How are those cells better than the conventional fuels?

170. Heavy water is left as a residue by carrying out the repeated electrolysis of ordinary water. Infact, its boiling point (374.42K) is slightly more than that of ordinary water (373K). It is very expensive and this can be judged by the fact about 29000 litres water on repeated electrolysis leave behind one litre of heavy water (D_2O).

(i) How is heavy water different from ordinary water is its biological action?

(ii) Give the chemical reactions of heavy water with Al_4C_3 and CaC_2).

(iii) What are the values associated with the use of heavy water?



171. Hydrocarbon perioxide is a thich syrup liquid with a better taste. It can be prepared by a number of methods both in the laboratory as well as commercially. However, the concentrations of hydrogen peroxide is a big problem since it readily decomposes when heated under normal conditions of temperature and pressure.

(i) How is the strength of H_2O_2 generally expressed?



(iii) What are the values associated with the use of hydrogen perioxde?

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172. Both temperary ad permanent hardness in water are removed by:

A. boiling

B. filtration

C. distillation

D. decantation.

Answer: c

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173. Both temperary and permanent hardness are removed on boiling water with:
A. $Ca(OH)_2$

B. $NaCO_3$

 $C. CaCO_3$

D. CaO.

Answer: a

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174. Temperorary hardness is caused due to the presence of:

A. $CaSO_4$

 $\mathsf{B.}\, CaCl_2$

 $C. CaCO_3$

 $\mathsf{D.}\, Ca(HCO_3)_2.$

Answer: d

175. Permuitit is:

A. Hydrated sodium aluminium silicate

B. sodium hexametaphosphate

C. sodium silicate

D. sodium meta aluminate

Answer: a

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176. 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

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177. The melting point of most of the solid substances increases with an increase of pressure acting on them . However , ice melts at a temperature lower than its usual melting point when the pressure increases . This is because :

A. ice is less dense than water

B. it generates heat

C. chemical bonds break under pressure

D. none of thest

Answer: c

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178. A mixture of hydrazine and H_2O_2 is:

A. antiseptic

B. rocket fuel

C. germicide

D. insecticide

Answer: b

Watch Video Solution

179. Decomposition of H_2O_2 is retarded by :

 $2H_2O_2(l)
ightarrow 2H_2O(l)+O_2(g)$

A. traces of acids

B. acetanilide

C. finely divided metals

D. alcohols

Answer: b



181. 20mL of sample of H_2O_2 gives 400mL of oxygen measured at NTP.

The sample should be labelled as:

A. 5 vol. H_2O_2

B. dil. H_2O_2 .

C. anhydrous H_2O_2

D. 20 vol. H_2O_2

Answer: d

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182. An orange coloured solution acidified with H_2SO_4 and treated with a substance 'X' gives a blue coloured solution of CrO_5 . The substance 'X' is

A. H_2O

B. dil. HCl

 $\mathsf{C}.\,H_2O_2$

D. conc. HCl

Answer: c

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183. Heavy water is qualified as heavy because it is:

A. a heavy liquid

B. an oxide of a heavier isotope of oxygen

C. an oxidex of deuterium

D. denser of water

Answer: c

Watch Video Solution

184. CaH_2 is an example of:

A. ionic hydride

B. covalent hydride

C. metallic hydride

D. none of thest

Answer: a

Watch Video Solution

185. What is the valency of hydrogen in hydride ion?

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186. Name two metals which can displace hydrogen from acids.

Watch Video Solution

187. Name the gas evolved when sodium hydrides reacts with water,



188. Give the example of the reaction in which hydrogen acts as an oxidant

O Watch Video Solution

189. What is the phenomenon of adsorption in which hydrogen on the

surface of a metal called?

Watch Video Solution

190. Which isotope of hydrogen is radioactive in nature?



191. Can we use conc. H_2SO_4 for preparing hydrogen gas from zinc

metal?



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196. Hydrogen form compounds with elements having atomic number 9.11.12 and 17. Write the chemical formulae.



200. Why has D_2O more density than H_2O
Watch Video Solution
201. How will you test the presnece of moisture?
Vatch Video Solution
202. How is temporary hardness in water removed?
Vatch Video Solution
203. Discuss the use of calogen in removing hardness from water
Vatch Video Solution

204. Complete the following reactions:

(i) $CaO(s) + H_2O(l)
ightarrow$

 $Na_2O(s)+H_2O(l)
ightarrow$

Watch Video Solution

205. How does H_2O_2 act as bleaching agent?

Watch Video Solution

206. Why cannot we concentrate hydrogen preoxide solution on direct

heating?



207. Is H_2O_2 planar in nature?

Watch Video Solution

208. What happens when H_2O is treated with acidified solution of $K_2Cr_2O_7$ containing some ether?

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209. Hydrogen peroxide acts as:

A. An oxidising agent

B. a reducing agent

C. An acid

D. All the three.

Answer:

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210. Which of the following statements is not correct?

- A. H_2O_2 oxidises Fe(II) to Fe(II)
- B. H_2O_2 can be prepared by the electrolysis of dilute H_2SO_4
- C. H_2O_2 reduces Mn(VII)toM(V)
- D. H_2O_2 is weak base.

Answer:

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211. The volume strength of 1.5 H_2O_2 solutions is

A. 4.8

 $\mathsf{B.8.4}$

C. 3.0

D. 8.0

Answer:

212. Moist H_2O_2 cannot be dried conc. H_2SO_4 because:

A. it can catch fire

B. it is reduced by H_2SO_4

C. it is oxidised by H_2SO_4

D. none of thest

Answer:

View Text Solution

213. If an isotope of huydrogen has two neutrons on its atom, the atomic number and mass number will respectively will be:

A. 2 and 1

B. 3 and 1

C. 1 and 1

D. 1 and 3

Answer:



214. As its melting point, ice is lighter than water because:

A. H_2O molecules are more closely packed in the solid state

B. ice crystals have follow hexagonal arrangement of H_2O molecules

C. on melting of ice H_2O molecules shrink in size

D. ice forms mostly heavy water on first melting.

Answer:

View Text Solution

215. Hardness of water is due to the pair if ions:

- A. Ca^{2+} and K^+
- $\mathsf{B}.\, Mg^{2\,+} \; \text{ and } \; K^{\,+}$
- C. Ca^{2+} and Mg^{2+}
- D. Ba^{2+} and Zn^{2+}

Answer:



216. The O-O-H bond angle in H_2O_2 is:

A. $106\,^\circ$

B. $109^{\,\circ}\,.28^{\,\circ}$

C. 120

D. 97°

Answer:

217. All of the following substances react with wter. The pair that yeilds the same gaseous product is

A. K and KO_2

B. Ca and CaH_2

C. `Na and Na_(2)

D. Ba and BaO_2

Answer:

View Text Solution

218. Nascent hydrogen consists of:

A. Hydrogen atoms with excess energy

B. Hydrogen molecules with excess energy

C. Hydrogen ions with in the excited state

D. Solvated protons

Answer:

View Text Solution

219. Nascent hydrogen is prepared by

A. Na and C_2H_5OH

B. Al and NaOH

C. Zn and dil. H_2SO_4

D. All the three.

Answer:

View Text Solution

220. In aqueous solution, hydrogen perioxide oxidises H_2S to

A. Sulphur

B. sulphuric acid

C. Caro's acid

D. Marshall's acid

Answer:

View Text Solution

221. The metal which gives hydrogen on reacting with acid as well as sodium hydroxide is:

A. Fe

B. Zn

C. Cu

D. none of thest

Answer:



223. Which of the foilowing pairs of substances on reaction will not envolve H_2 gas?

A. Iron and $H_2SO_4(aq)$

B. Iron and steam

C. Copper and HCl(aq)

D. Sodium and ethanol.

Answer:

O View Text Solution

224. The structure of H_2O_2 is:

A. Planer

B. Non planar

C. Spherical

D. Linear

Answer:

225. In which of the following reactions H_2O_2 acts as reducing agent?

A.
$$H_2O_2 + SO_2
ightarrow H_2SO_4$$

B. $2Kl + H_2O_2
ightarrow 2KOH + I_2$
C. $PbS + 4H_2O_2
ightarrow PbSO_4 + 4H_2O$
D. $Ag_2O + H_2O_2
ightarrow 2Ag + H_2O + O_2$

Answer:

View Text Solution

226. Which of the following will not displace hydrogen?

A. Ba

B. Pb

C. Hg

D. Sn

Answer:

D View Text Solution

227. The absrobtion of hydroen by palladium is called:

A. Hydrogenation

B. Hydration Reduction

C. Reduction Occlusion.

D.

Answer:

View Text Solution

228. Pure of water is obtained from sea water by:

A. Centrifugation

B. Plasmolysis

C. Reverse Osmosis

D. Sedimentation

Answer:

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229. Which is used as moderator in nuclear reactor?

A. H_2O

B. Alum

 $\mathsf{C}.\,D_2O$

D. Any of these

Answer: C

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230. Oxidation satate of oxygen in H_2O_2 is:

B. 1

A. -1

C. -2

D. 2

Answer: A

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231. Which of the following gives H_2 with Na metal?

A. CH_4

 $\mathsf{B.}\, C_2 H_6$

 $\mathsf{C.}\, C_2 H_4$

 $\mathsf{D.}\, C_2 H_2$

Answer:



232. Proton is likely to have high:

A. Hydration energy

B. Electron affinity

C. Atomic size

D. Atomic mass

Answer:

Watch Video Solution

233. The reagent commonly used todetermine the hardness of water titrametrically is:

A. Oxalic acid

- B. disodium salt of EDTA
- C. sodium citrate
- D. sodium thiosulphate

Answer:

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234. Water softening by Clarke's process used:

- A. Calcium bicarbonate
- B. Sodium bicarbonate
- C. Potash alum
- D. Calcium hydroxide

Answer:

235. Which of following could act as propelleant for rockets?

A. Liquid oxygen+liquid argon

B. Liquid nitrogen+liquid oxygen

C. Liquid hydrogen+liquid oxgyen

D. Liquid hydrogen+liquid nitrogen.

Answer:

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236. Hydrogen perxoide acts as oxidising agent?

A. netural medium

B. alkaline medium

C. alkaline and neutral medium

D. acidic and alkaline medium.

Answer:



237. Bya adding which of the following the permanent hardeness of water

can be removed?

A. Soda lime

B. Sodium bicarbonate

C. Washing soda

D. Sodium chloride.

Answer:

238. Permanent harndness from water can be removed by adding:

A. Na_2CO_3

B. K

C. Ca(OCl)Cl

D. H_2SO_5

Answer:

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239. H_2SO_4 is added to 20% cold aqueous solution of BaO_2 . The product formed is:

A. H_2O_2

B. BaO

 $C. Ba(OH)_2$

D. H_2SO_5

Answer:



240. Zeolite used to soften hardness of water is hydrated:

- A. Potassium aluminium borate
- B. Sodium aluminium silicate
- C. Calcium aluminium silicate
- D. Zinc aluminium silicate.

Answer:

View Text Solution

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

A. $Ca_{3}(PO_{4})_{2}$

 $B.Ca(OH)_2$

 $C. Na_2CO_3$

D. Na_2CO_3 .

Answer:

View Text Solution

242. In which of the following reactions H_2O_2 acts as reducing agent?

 $(I)H_2O_2+2H^++2e^ightarrow 2H_2O$

 $(II)H_2O_2-2e^ightarrow O_2+2H^+$

 $(III)H_2O_2+2e^ightarrow 2OH^-$

 $(IV)H_2O_2 + 2OH^- - 2e^- o O_2 + 2H_2O$

243. Hydrogen peroxide in its reaction with KIO_4 and NH_2OH respectivley, is acting as a

A. reducing agent, oxidising agent

B. reducing agent, oxidsing agent

C. oxidisign agent, oxidising agent

D. oxidising agent, reducing agent

Answer:

View Text Solution

244. In the production of dihydrogen gas via water gas shift reaction

$$CO(g) + H_2(g) \stackrel{ ext{heat}}{ ext{Catalyst}} CO_2(g) + H_2(g)$$

 CO_2 gas is removed by scrubbing with solution of

A. Sodium arsenite

B. Calcium oxide

C. Sodium phosphite

D. Aluminium oxide,

Answer:

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245. From the following statements reagarding H_2O_2 . Choose the incorrect statements

A. It has to be stored inplastic or wax linked glass bottles in dark.

B. It ha to be kept away from dust

C. It can act only as an oxidizing agent.

D. It decomposes on exposure to light.

Answer:
246. The molecular formula of a commercial resin used for exchanging ions in wter softening is $C_8H_7SO_{3Na}$ (mol.wt.206), What would be the maximum uptake of Ca^{2+} ions by resin when expressed in moe per gram resin?



Answer:

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247. The volume strength of 1.54 NH_2O_2 solution is:

A. 4.8L

B. 5.2L

C. 8.4L

D. 8.8L

Answer:

View Text Solution

248. Water softening by Clarke's process used:

A. $NaHCO_3$

B. $Ca(OH)_2$

 $C.Ca(HCO_3)_2$

D. Na_2CO_3 .

Answer:

249. Which of the following statements about hydrogen are incorrect?

A. Hydronium ion, H_3O^+ exists freely in solution.

B. Dihydrogen does not act as a reducing agent.

C. Hydrogen has three isotopes of which tritium is the most common.

D. Hydrogen never acts as cation in ionic salts.

Answer:

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250. Which of the following statements about water is false?

A. Water is oxidized to oxygen during bonding in the condensed

phase

B. Water can act both as an acid and as a base.

C. There is extensive inframolecular hydrogen bonding in the

condensed phase

D. Ice formed by heavy water sinks in normal water.

Answer:

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251. hydrogen is an enormousy attractive fuel because it is enviromently clean.'Hydrogen economy' is a new field in which it is thought that our energy needs can be met by gaaseous, liquid and solid hydrogen. Since hydrogen is not a naturally occuring substance like coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used. Current researches are therefore, on finding cheaper methods for extracting hydrogen.

Which fuel does produce least enviormental pollution?

A. Kerosene oil

B. Hydrogen

C. Wood

D. Coal.

Answer:

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252. hydrogen is an enormousy attractive fuel because it is enviromently clean.'Hydrogen economy' is a new field in which it is thought that our energy needs can be met by gaaseous, liquid and solid hydrogen. Since hydrogen is not a naturally occuring substance like coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used. Current researches are therefore, on finding cheaper methods for extracting hydrogen.

If an isotope of hydrogen has two neutrons in its atoms, its atomic number and atomic mass number will respectively by:

A. 2and 1

B. 3 and 1

C. 1 and 1

D.1 and 3

Answer:

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253. hydrogen is an enormousy attractive fuel because it is enviromently clean.'Hydrogen economy' is a new field in which it is thought that our energy needs can be met by gaaseous, liquid and solid hydrogen. Since hydrogen is not a naturally occuring substance like coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used. Current researches are therefore, on finding cheaper methods for extracting hydrogen.

Which of the following gas is lightest?

A. Oxygen

B. Ammonia

C. Hydrogen

D. Helium.

Answer:

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254. hydrogen is an enormousy attractive fuel because it is enviromently clean.'Hydrogen economy' is a new field in which it is thought that our energy needs can be met by gaaseous, liquid and solid hydrogen. Since hydrogen is not a naturally occuring substance like coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used. Current researches are therefore, on finding cheaper methods for extracting hydrogen.

Which isotope of hydrogen is radioactive in nature?

A. Protium only

B. Deuterium only

C. Deitrium and tritium

D. Tritium only.

Answer:

View Text Solution

255. hydrogen is an enormousy attractive fuel because it is enviromently clean.'Hydrogen economy' is a new field in which it is thought that our energy needs can be met by gaaseous, liquid and solid hydrogen. Since hydrogen is not a naturally occuring substance like coal, oil or natural gas, energy must be expended to produce hydrogen before it can be used. Current researches are therefore, on finding cheaper methods for extracting hydrogen.

Liquid H_2 has been used as a rocket fuel because of

A. High thrust

B. Its reaction with oxygen is highly exothermic

C. Small space it occupies

D. All these are correct

Answer:

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256. H_2O_2 is a powerful oxidising agent. It is an electron acceptor in acidic as well as in alkaline medium. It can also act as reducing agent towards oxidising agents. In alkaline medium, the reducing nature of H_2O_2 is even more effective

In which of the following reactions H_2O_2 acts as a reducing agent?

A.
$$PbO_2 + H_2O_2
ightarrow PbO + H_2O + O_2$$

$$\mathsf{B.} \ Na_2SO_3 + H_2O_2 \rightarrow Na_2SO_4 + H_2O_2$$

 $\mathsf{C.}\, 2KI + H_2O_2 \rightarrow 2KOH + I_2$

D.
$$KNO_2 + H_2O_2
ightarrow KNO_3 + H_2O_3$$

Answer:

257. H_2O_2 is a powerful oxidising agent. It is an electron acceptor in acidic as well as in alkaline medium. It can also act as reducing agent towards oxidising agents. In alkaline medium, the reducing nature of H_2O_2 is even more effective

In which of the following reactions, H_2O_2 acts as an oxidising agent?

A.
$$IO_4^- + H_2O_2 \rightarrow IO_3^- + H_2O + O_2$$

B. $2I^- + H_2O_2 + 2H^+ \rightarrow I_2 + 2H_2O$
C. $Ag_2O + H_2O_2 \rightarrow 2Ag + H_2O + O_2$
D. $2MnO_4^- + 6H^- + 5H_2O_2 \rightarrow 2Mn^{2+} + 8H_2O + 5O_2$

Answer:

View Text Solution

258. H_2O_2 is a powerful oxidising agent. It is an electron acceptor in acidic as well as in alkaline medium. It can also act as reducing agent towards oxidising agents. In alkaline medium, the reducing nature of

 H_2O_2 is even more effective

The bleaching properties of H_2O_2 are due to its:

A. Unstable nature

B. Acidic nature

C. Reducing nature

D. Oxidising nature.

Answer:

View Text Solution

259. H_2O_2 is a powerful oxidising agent. It is an electron acceptor in acidic as well as in alkaline medium. It can also act as reducing agent towards oxidising agents. In alkaline medium, the reducing nature of H_2O_2 is even more effective Decolourisation of acidified $KMnO_4$ occurs when H_2O_2 is added to it.

This is due to

A. Oxisation of $KMnO_4$

B. Reducing of $KMnO_4$

C. Both oxidation and reduction of $KMnO_40$

D. none of these

Answer:

View Text Solution

260. Assertion: Hydrogen combines with other elements by losing, gaining or sharing electrons. Reason:Hydrogen forms electrovalent and covalent bonds with other elements .



261. Assertion::In the electrolysis of water containing 15 to 20 percent $H_2SO_4SO_4^{2-}$ ions are not discharged at anode. Reason: The discharge potentail of SO_4^{2-} ions is higher than that OH^- ions.

262. Assertion: Nascent hydrogen can discharged the pink colour of $KMnO_4$ solution. Reason:Nascent hydrogen is much more reactive than ordinary hydrogen.

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263. Assertion: H_2O_2 reduces Cl_2 toHCl. Reason: H_2O_2 is highly Cl_2 toHCl

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264. Assertion: Calgon is used for removing Ca^{2+} and Mg^{2+} ions from hard water. Reason: Calogon forms precipatate with Ca^{2+} and Mg^{2+} ions.

265. Assertion:Temporary hardness can be removed by the addition of lime

 $Ca(HCO_3)_2$ in hard water is converted to insoluble $CaCO_3$ on moderate heating.

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266. Statement-1:Colour of lead paintings can be restored by washing with dilute solution of H_2O_2 Statement-2: Hydrogen sulphide oxdises black lead sulphide to white lead sulphate.

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267. Statement-1: H_2O_2 can be used as an antichlor in bleaching Statement-2: It oxidises $HCltoCl_2$

268. Statement-1:Decomposition of H_2O_2 is a dispoportionation reaction. Statement-2: H_2O_2 undergoes simultaneous oxidation and reduction reactions.

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269. Statement-1:Boiling point temperature of H_2O_2 is little more than of				

 H_2O . Statement-2: Dipole moment of H_2O_2 is little more than of H_2O

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270. Statement-1:Beryllium hydride is of covalent nature. Statement-2:The

electronegativity difference between Be and H is very large.

271. Statement-1:Permanent hardness in water is removed by treatment with washing soda. Statement-2: Washing soda reacts with magnesium and calcium sulphate to from insouble carbonates.



List I

- 1. Heavy water
- 2. Temporary hard water
- 3. Soft water
- 4. Permanent hard
- 272. water

List II

- (a) Bicarbonates of Mg and Ca in water
- (b) No foreign ions in water
- (*c*) D₂O
- (*d*) Sulphates and chlorides of Mg and Ca in water

273.	Match	the	following	columns
(A) (B) (C) (D) (E)	Hydride type Electron deficient Saline Electron-precise Interstitial Electron rich	tne	Compound (<i>i</i>) LiH (<i>ii</i>) CH ₄ (<i>iii</i>) NH ₃ (<i>iv</i>) B ₂ H ₆ (<i>v</i>) CrH	columns

274. Calculation the normality of 30 volume solution of hydrogen peroxide

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275. What is the mass of hydrogen peroxide present in 1 litre of a 2M solution? Calculate the volume of oxygen a N.T.P. liberated upon the compleite decomposition of 100mL of the solution.

276. 25 ml of hydrogen peroxide solution were added to excess of acidified potassiutm iodide solution. The iodine so liberated required 20mL of 0.1 sodium this sulphate solution. Calculate the strenth in terms of normality, percentage and volume.