CHEMISTRY

BOOKS - ARIHANT CHEMISTRY (HINGLISH)

HYDROGEN

Practice Exercise

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

A. Ionisation enthalpy of hydrogen resembles to that of alkali

B. Its reactivity is similar to halogens

C. It resembles both alkali metals and halogens

D. Loss of an electron from hydrogen atom results in a nucleus of very samall size as compared to other atoms or ions. Due to small size , it cannot exist free

Answer: D

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2. Which of the following explanation is best for not placing hydrogen in either the group of alkali metals or halogens?

A. lonisation energy of the hydrogen is too higher for group of alkali metals and too low for the halogen group

B. Hydrogen atoms does not contain any neutron

C. Hydrogen is much lighter than the alkali metals of halogens

D. Hydrogen can from compounds with almost all other elements

Answer: A

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3. Othro and para hydrogens differ in the

A. number of protons

B. molecules wiegth

C. nature of spins of protons

D. nature of spins of electrons

Answer: C

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4. Consider the following statements about othro and para-hydrogen

I. In orhto-hydrogen, the spin of protons are in the same direction .

II. Orthro-hydrogen is more stable than the para from in the ambident condition.

III. At ordinary temperature,ordinary hydrogen is a mixture of about $75\ \%$ para and $25\ \%$ ortho forms ,

IV. Two forms have similar chemial properties but differ in physical propertise like specific heat and thermal conductivity.

Which of the statements given above are correct ?

A. I,II and III

B. II, III and IV

C. I, III and IV

D. I, II and IV

Answer: D

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

A. $CH_4(g) + H_2O(g) \xrightarrow[Nl]{1270K} CO(g) + 3H_2(g)$

B. $C(s) + H_2O(g) \xrightarrow{1270K} CO(g) + H_2(g)$

C. $CO(g) + H_2O(g) \xrightarrow[\text{Catalyst}]{673K} CO_2(g) + H_2(g)$

D. $C_2H_2 + 2H_2O \xrightarrow[NI]{1270K} 5CO_2(g) + 5H_2$

Answer: C

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6. The ionsisation of hydrogen atom gives

A. hydride ion

B. hydronium ion

C. proton

D. hydroxyl ion

Answer: C

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7. Pure H_2 is obtanied by the action of

A. aluminium with potassium hydroxide

B. Sodium hydride with water

C. electrolysis of warm solution of $Ba(OH)_2$ using Ni electrodes

D. All of these

Answer: D

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8. Hydrogen adsorabed on palladium is known as

A. atomic

B. ortho H

C. occluded H

D. heavy H

Answer: C

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9. The chemaical reactions of dihydrogen is accomoplishes by the

A. Loss of the only one electron to give H^+

B. gain of an electron to from H^-

C. Sharing electrons to froma single covalent bond

D. All of these

Answer: D

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10. Consider the following reaction

I. $H_2(g) + X_2(g) \rightarrow 2HX(g)(X = F, Cl, Br, l)$

II. $2H_2(g) + O_2(g) = \xrightarrow[\text{heating}]{\text{Catalyst}} 2H_2O(l)$

III. $3H_2(g) + N_2(g) = \xrightarrow[\text{Fe}]{\text{673 K. 200atm}} 2NH_3(g)$

IV. $H_2(g) + Pd^{2+}(aq) \rightarrow Pd(s) + 2H^+(aq)$

The correct reactions are .

A. II, III and IV

B. IV and V

C. I, II and IV

D. All of these

Answer: D

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11. Hyrogenation of vegetable oils using nickel as a catalyst give ebible fats is known as \

A. cocount oil

B. soyabean oil

C. margarine and vanaspati ghee

D. vanaspati ghee

Answer: C

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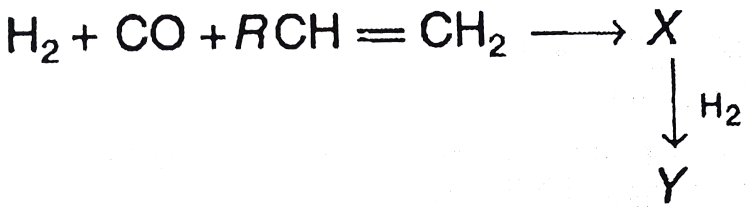

12. What are X and Y in the above reaction ?

A. RCH_2CH_2CHO and $RCH_2CH_2CH_2OH$

B. RCH_2CH_2CHO and RCH_2CH_2OH

C. CH_3CH_2CHO and CH_3CH_2OH

D. $CH_3CH_2CH_2CHO$ and $CH_3CH_2CH_2OH$

Answer: A

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13. Dilydrogen is used the

I. manufacturing of nitric acid and nitrogenous fertillisers.

II. Manufacturing of vanaspati fat.

III. Manufacturing of methanol.

IV. Perparartion of hydrogen choride.

Choose the correct option .

A. I, II and IV

B. II, III and IV

C. I,II and III

D. I,II,III and IV

Answer: D

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14. H_2 gas is libreated at cathode and anode both by the electrolysis of the following aqueous solution except in

A. NaH

B. KH

C. NaCl

D. Both (a) and (b)

Answer: C

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15. Hydrogen is perpared on large scale for an Industrial use

A. by $Zn + H_2SO_4$

B. by Al+ NaOH

C. $byNa + C_2H_5OH$

D. from water gas

Answer: D

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16. Which of the following is incorrect statement ?

A. s-bolck elements, execpet Be and Mg, from ionic hydrogen

B. $BeH_4, Mgh_2, CuH_2, ZnH_2, CaH_2$ and HgH_2 and HgH_2 intermediate hydrides

C. p-bolck elemets from covalent hydride

D. d and f-block element from inoic hydride

Answer: D

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17. The correct decreasing order of basic strengh of hydrides is

:

A. $AsH_3 > SbH_3 > PH_3 > NH_3$

B. $SbH_3 > AsH_3 > PH_3 > NH_3$

C. $NH_3 > PH_3 > AsH_3 > SbH_3$

D. $PH_3 > AsH_3 > SbH_3 > NH_3$

Answer: C

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18. The maximum possible number of hydrogen bonds a water molecule can form is

A. 1

B. 2

C. 3

D. 4

Answer: D

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19. Consider the following statements about intermolecular and intramolecular hydrogen bonds .ltbr gt I. Both types of H-bonds are temperature dependent.

II. Intramolecular H- bonds disapperears on increaassing the concentration

III. Intrmolecular H-bonds disppears on decreasing the concentration

IV. The boiling point of compounds having intramolecular H-bond are lower than that of those campounds which have intermolecular H- bonds

Which of the statement given above are correct ?

A. I, II and IV

B. III and IV

C. I,III and IV

D. I and II

Answer: A

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20. The boiling points of water is high because

A. Water molecular is liner

B. Water molecule is not linear

C. Water molecule possess covalent bond between H and O

D. Water molecules associate due to H-bonding

Answer: D

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21. Two ice cubes are pressed over each other until they unite to form one block. The force mainly responsible for holding them together is

A. Ionic intraction

B. van der interacting

C. Covalent interaction

D. Hydrogen bond formation

Answer: D

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22. If one assume linear structure instead of bent structure for water then which on of the following properties cannot be explained ? .

A. Formation of intermlecular hydrogen boniding in water

B. High boiling point water

C. Solution of polar compounds in water

D. Ability of water to from coordinate covalant bonds

Answer: B

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23. The strenght of an poxo acid (E - O - H), where E is the central atom , depends upon the

A. electronegativity of E

B. atomic size of E

C. ability of E to share electron pair with O

D. atomic size and electronegativity of E

Answer: A

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24. Heavy water (D_2O) freezes at

A. $0^\circ C$

B. $3.8^\circ C$

C. $-3.8^\circ C$

D. $38^\circ C$

Answer: B

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25. Boiloing points of heavy water is :

A. $100^\circ C$

B. $99^\circ C$

C. $101.4^\circ C$

D. $110^\circ C$

Answer: C

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26. Which of the following statements are correct regarding D_2O and H_2O?

I. D_2O reacts with Al_4C_3 at a faster rate than does H_2O.

II. The freezing point of $D_2O$is higher than that of H_2O.

III. NaCl is more solution in D_2O than in H_2O.

IV. Ionic product of D_2O is smaller than that if H_2O.

Select the correct answer using the codes givem below.

A. I and II

B. I and III

C. II and III

D. II and IV

Answer: D

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27. Mass precentage of deuterium in heavy water is

A. same as that of protium in water

B. 11.1

C. 20

D. Cannot be predicated

Answer: C

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28. A mixture of hydazine (N_2H_4) and $58-60\,\%$ solution of H_2O_2 is used as

A. antiseptic

B. fertilliser

C. rocket fuel

D. None of the above

Answer: C

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29. Which of the following oxides is a peroxide ?

A. Na_2O_2

B. MnO_2

C. BaO

D. So_2

Answer: A

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30. Hydrogen peroxide is used as

A. an oxidant only

B. a reductant only

C. an acid only

D. All of these

Answer: D

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31. Which of the following statememts are not correct ?

A. H_2O_2 oxidises Fe (II)to Fe (III)

B. H_2O_2 can be obatined by the electrolysis of dill. H_2SO_2

C. H_2O_2 reduces Mn (VII) to Mn (II)

D. H_2O_2 is a weak base

Answer: D

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32. 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. Sulphic acid undergoes oxidation

Answer: C

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33. Match the Column I with Column II and select the correct option fom the codes given below .

	Column I		Column II
A.	10 vol H_2O_2	1.	Perhydrol
B.	20 vol H_2O_2	2.	5.358 N
C.	30 vol H_2O_2	3.	1.785 M
D.	100 vol H_2O_2	4.	3.03%

Codes

	A	B	C	D
a.	4	3	2	1
b.	1	2	3	4
c.	1	3	2	4
d.	4	2	3	1

codes.

A. $\begin{matrix} A & B & C & D \\ 4 & 3 & 2 & 1 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 1 & 2 & 3 & 4 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 1 & 3 & 2 & 4 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 4 & 2 & 3 & 1 \end{matrix}$

Answer: A

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34. Study the following reaction carefully

I. $HOCl + H_2O_2 \rightarrow H_3O^+Cl^- + O_2$

II. $PbS + 4H_2O_2 \rightarrow PsSO_4 + 4H_2O$

Point out the correct option.

A. In (I), HOCl is reduced and in (II) . PbS is oxidised

B. In (I), HOCl is oxidised and in (II) . PbS is reduced .

C. In both (I) and (II), HOCl and PbS are reduced

D. In both (I) and (II), HOCl and PbS are oxidised

Answer: A

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35. 6 volume sample of H_2O_2

A. would given 6 volumes of oxyen per unit volume of H_2O_2 sample at STP

B. will contain $6\,\%\,V/V$ of H_2O_2

C. will contain $6\,\%\,W/V$ of H_2O_2

D. would give 6 volumes of oxygen per unit weight of H_2O_2 sample at STP

Answer: A

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

A. $H^+ ion$

B. $Ca^{2+} ion$

C. $SO_4^{2-} ion$

D. $HO^- ion$

Answer: B

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37. 1000 gram aqueous solution of $CaCO_3$ contains 10 gram of carbonate. Concentration of solution is:

A. 10ppm

B. 100ppm

C. 1000ppm

D. 10000ppm

Answer: D

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38. A $100mL$ of tap water was titrated with $M/50HCl$ with methyle orange as indicator. If $30mLofHCl$ were required. Calculate the hardness of $CaCO_3$ per 10^3 parts of water. The hardness is temporary.

A. 150ppm

B. 600ppm

C. 275ppm

D. 300ppm

Answer: D

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39. Excess of Kl and dill. H_2SO_4 were mixed in 50 mL H_2O_2. Thus, l_2 liberated requires 20 mL of 0.1 N $Na_2S_2O_3$. What will be the strenght of H_2O_2 in g L^{-1} ?

A. 0.034

B. 0.68

C. 6.8

D. 5.8

Answer: B

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40. H_2O_2 is marked 22.4 volume. How much of it is required to oxidise $3.5gH_2S$ gas?

A. $10mL$

B. $70mL$

C. $100mL$

D. $1000mL$

Answer: C

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41. Temporaty hardness of water is caused due to the presence of

A. $CaSO_4$

B. $CaCl_2$

C. $CaCO_3$

D. $Ca(HCO_3)$

Answer: D

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

A. $CaSO_4$

B. Na_2CO_3

C. $CaCO_3$

D. CaO

Answer: B

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43. Which one of the following is used for reviving the exhusated permutit ?

A. HCl soltuion

B. $10\ \%\ CaCl_2$ solution

C. $10\ \%\ Mgl_2$ Solution

D. $10\ \%$ NaCl solution

Answer: D

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1. Which one the following is a covalent hydride ?

A. CaH_2

B. NaH

C. BH_3

D. BeH_2

Answer: C

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

A. C_2D_2

B. CaD_2

C. CaD_2O

D. CD_2

Answer: A

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3. H_2O_2 is always stored in black bottles because

A. it is high unstable

B. its enthalpy of decomposition is high

C. it undergoes autoxidation on prolong standing

D. None of the above

Answer: C

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4. H_2O_2 used in rockets has the concentration

A. $50\ \%$

B. $70\ \%$

C. $30\ \%$

D. $90\ \%$

Answer: D

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5. Calgon used as water softner is

A. $Na_2\left[Na_4(PO_3)_6\right]$

B. $Na_4\left[Na_2(PO_3)_6\right]$

C. $Na_2\left[Na_4(PO_4)_5\right]$

D. None of the above

Answer: A

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