



CHEMISTRY

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

HYDROGEN AND ITS COMPOUNDS

Solved Problems

1. Comment on the reactions of dihydrogen with (i) chloride (ii) sodium, and (iii) copper (II)

oxide.



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2. Comment on the reactions of dihydrogen with (i) chloride (ii) sodium, and (iii) copper (II) oxide.



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3. Comment on the reactions of dihydrogen with (i) chloride (ii) sodium, and (iii) copper (II)

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4. H_2O has higher boiling point than that of H_2S . Give reasons.



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5. How many hydrogen bonded water molecules are associated in $CuSO_4 \cdot 5H_2O$?



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



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Very Short Answer Questions

1. The three isotopes of hydrogen differ in their rates of reaction. Give the reasons.



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2. Why is dihydrogen used in welding of high melting metals ?



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3. Describe one method of producing high purity hydrogen.



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4. Explain the term "SYNGAS".



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5. What is meant by coal gasification? Explain with relevant, balanced equation.



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6. Define the term Hydride. How many categories of hydrides are known? Name them.



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7. The unusual property of water in condensed phase leads to its high heat of vapourization.

What is that property?



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8. During photosynthesis, water is oxidized to O_2 . What element is reduced?



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9. What do you mean by autoprotolysis? Give the equation to represent the autoprotolysis of water.



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10. Water behaves as an amphoteric substance in the Bronsted sense. How do you explain?



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Short Answer Questions

1. The boiling points of NH_3 , H_2O and HF are higher than those of the hydrides of the subsequent members of the group. Give your reasons.



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2. Discuss the position of hydrogen in the periodic table on the basis of its electronic configuration.



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3. How is the electronic configuration of hydrogen suitable for its chemical reactions ?



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4. What happen when dihydrogen reacts with
(a) Chlorine ? Explain.



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5. Write a note on heavy water.



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6. Name the isotopes of hydrogen. What is the ratio of the masses of these isotopes?



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7. What is water - gas shift reaction? How can the production of didydrogen be in creased by

this reaction?



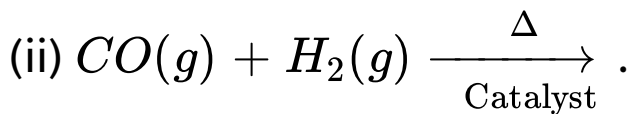
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8. Complete and balance the following reactions :



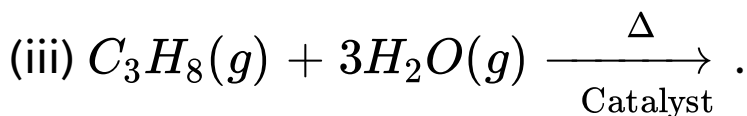
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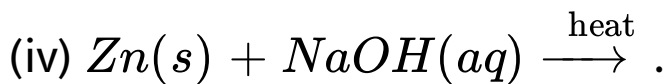
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10. Complete and balance the following reactions :



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11. Complete and balance the following reactions :



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12. What is the nature of the hydrides formed by elements of 13 group?



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13. Discuss the principle and the method of softening of hard water by synthetic, ionexchange resins.



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14. Write a few lines on the utility of hydrogen as a fuel.



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15. A 1% solution of H_2O_2 is provided to you. What steps do you take to prepare pure H_2O_2 from it?



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16. Mention any three uses of H_2O_2 in modern times.



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Long Answer Questions

1. Write an essay on the commercial preparation of dihydrogen. Give balanced equations.



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2. Illustrate the chemistry of dihydrogen by its reaction with

(i) N_2



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3. Explain, with suitable examples, the following:

(i) Electron-deficient.



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4. Write in brief on

(i) ionic hydrides



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5. Explain any four of the chemical properties of water.



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6. Explain the terms hard water and soft water.

Write a note on the

(i) Ion - exchange method.



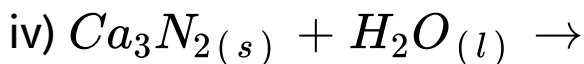
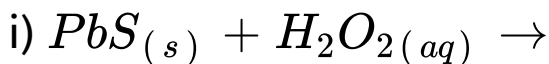
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7. Write the chemical reaction to justify that hydrogen peroxide can function as an oxidizing as well as reducing agent.



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8. Complete and balance the following chemical reactions :



Classify the above into a) hydrolysis b) redox and c) hydration reactions.



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9. Discuss, with relevant chemical equations, various methods of preparing hydrogen peroxide. Which of these methods is useful to prepare D_2O_2 ?



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10. In how many ways can you express the strength of H_2O_2 ? Calculate the strength of 15 volume solution of H_2O_2 . in g/l . Express the strength in normality and molarity.





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Important Questions

1. Why is dihydrogen used in welding of high melting metals ?



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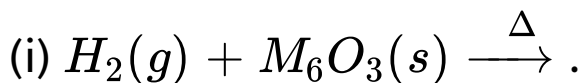
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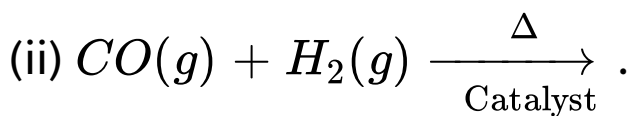
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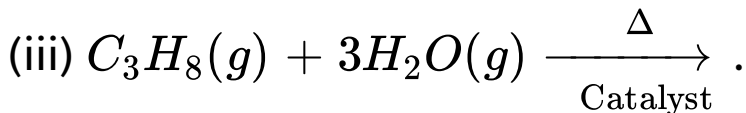
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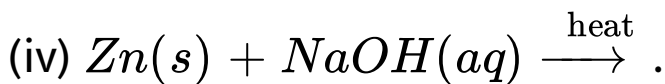
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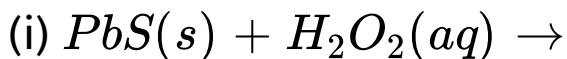
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