

CHEMISTRY

BOOKS - A N EXCEL PUBLICATION

HYDROGEN

Question Bank

1. Write the names of isotopes of hydrogen.

What is the mass ratio of these isotopes?



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2. Why does hydrogen occur in a diatomic form rather than in a monoatomic form under normal conditions?



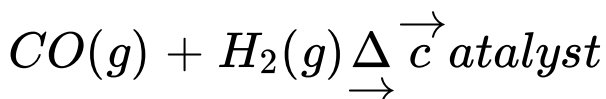
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3. About 18% of the total production of dihydrogen is from coal. What is 'coal gasification'?



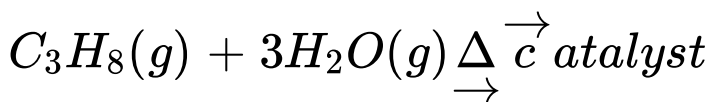
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4. Complete the following reactions



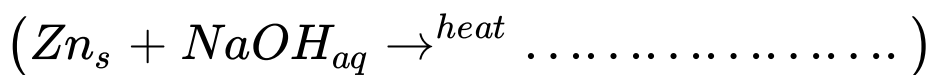
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5. Complete the following reactions



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6. Complete the following reaction.



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7. Discuss the consequences of high bond enthalpy of H-H bond in terms of chemical reactivity.



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



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9. Do you expect carbohydrides of the type $[C_nH_{2n+2}]$ to act as Lewis acid or base? Why?



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10. What do you mean by non-stoichiometric hydrides?



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11. How do you expect the metallic hydrides to be useful for hydrogen storage? Explain



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12. How do you expect the metallic hydrides to be useful for hydrogen storage? Explain



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



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14. Saline hydrides are known to react with water violently producing fire. Can CO_2 a well known fire extinguisher be used in this case? Explain.



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15. Arrange the following CaH_2 , BeH_2 and TiH_2 in order of increasing electrical conductance



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16. Arrange the following LiH, NaH and CsH in order of increasing ionic nature



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17. Arrange the following H-H, D₂, and F-F in order of increasing bond dissociation enthalpy



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18. Arrange the following NaH , MgH_2 and H_2O in order of increasing reducing property



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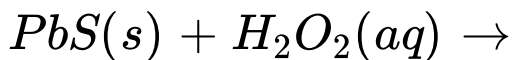
19. What is meant by 'autoprotolysis' of water?

What is its significance?



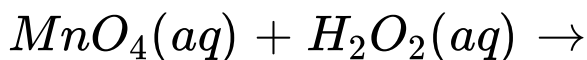
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20. Complete the chemical reactions



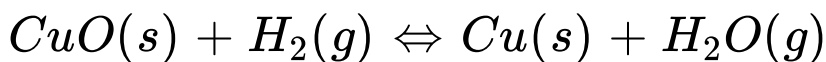
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21. Complete the chemical reactions



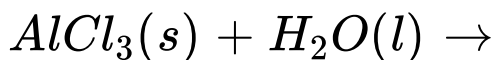
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22. Write expressions for the equilibrium constant for the following reactions.



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23. Complete the chemical reactions



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24. Complete the chemical reactions



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25. What is meant by 'demineralised water'?



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26. Is demineralised or distilled water useful for drinking purposes? If not, how can it be

made useful?



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27. Knowing the properties of H_2O and D_2O .

Do you think that D_2O can be used for drinking purpose?



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28. What do you expect the nature of hydrides formed by elements of atomic number 15, 19

,23 and 44 with hydrogen?



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29. The efficiency of a boiler is found to decrease when boiler scales are formed. Write the chemistry of scale formation?



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30. The efficiency of a boiler is found to decrease when boiler scales are formed. Write

the chemistry of scale formation?



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31. The efficiency of a boiler is found to decrease when boiler scales are formed. Suggest a suitable chemical method to prevent the scale formation.



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32. Density of ice is lower than that of water.



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33. Account for the following observations: i)

The density of ice is lower than that of water.

ii) Hard water doesn't give ready lather with soap.



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34. Justify the position of hydrogen in the periodic table



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35. Hydrogen peroxide is an important chemical used in pollution control treatment of domestic and industrial effluents. Write the molecular formula of hydrogen peroxide.



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36. Draw the structure of hydrogen peroxide



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37. Explain with suitable chemical equation, why hydrogen peroxide is stored in waxlined glass or plastic vessels in dark.



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38. Permanent hardness of water can be removed only by chemical methods. Write the name of any one salt responsible for the permanent hardness of water.



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39. Permanent hardness of water can be removed only by chemical methods. Sodium hexametaphosphate is commercially called.....



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40. How is sodium hexametaphosphate useful in removing the permanent hardness of water?



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41. Suggest a disadvantage of hard water.



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42. Hard water contains calcium and magnesium salts. Therefore it does not lather with soap. Hard water is harmful for boilers. Why?



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43. How will you remove the hardness from the water by using washing soda?



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44. Which method is more suitable to get pure demineralised water?



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45. Hydrogen peroxide is stored in plastic vessels in dark why?



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46. What is coal gasification?



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47. About 18% of the total production of dihydrogen is from coal. How is dihydrogen

produced by a 'water-gas shift reaction'?



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48. Write any two uses of dihydrogen.



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49. Water is an amphoteric substance. Justify



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50. Hydrides are binary compounds of hydrogen with other elements. Give one example each for electron deficient and electron rich hydride.



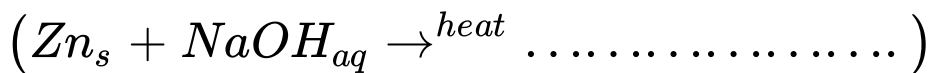
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51. H_2O_2 is a bleaching agent. Why?



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52. Complete the following reaction.



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53. In a seminar, if you are asked to present a paper on hydrogen economy, write any two points you are going to include in your paper.



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54. Syn gas' is a mixture of

A. CO and H_2O

B. CO and H_2

C. CO_2 and H_2

D. CH_4 and CO

Answer:



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55. A sample of river water does not give lather with soap easily when it is cold, but on heating gives ready lather with soap. Why?



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56. Draw the structure of a hydrogen peroxide molecule.



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57. Hydrogen reacts with most of the metals and non metals to form hydrides. Elements in which one of the following group/groups of the periodic table do not form hydrides?

A. Groups 15, 16, 17

B. Group 13

C. Group 7, 8, 9,

D. Group 14

Answer:



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58. Hydrogen peroxide restore the colour of lead paintings. Give a reason.



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59. How does the atomic hydrogen torch function for cutting and welding purposes.



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