

## Chemistry

### Ch-7

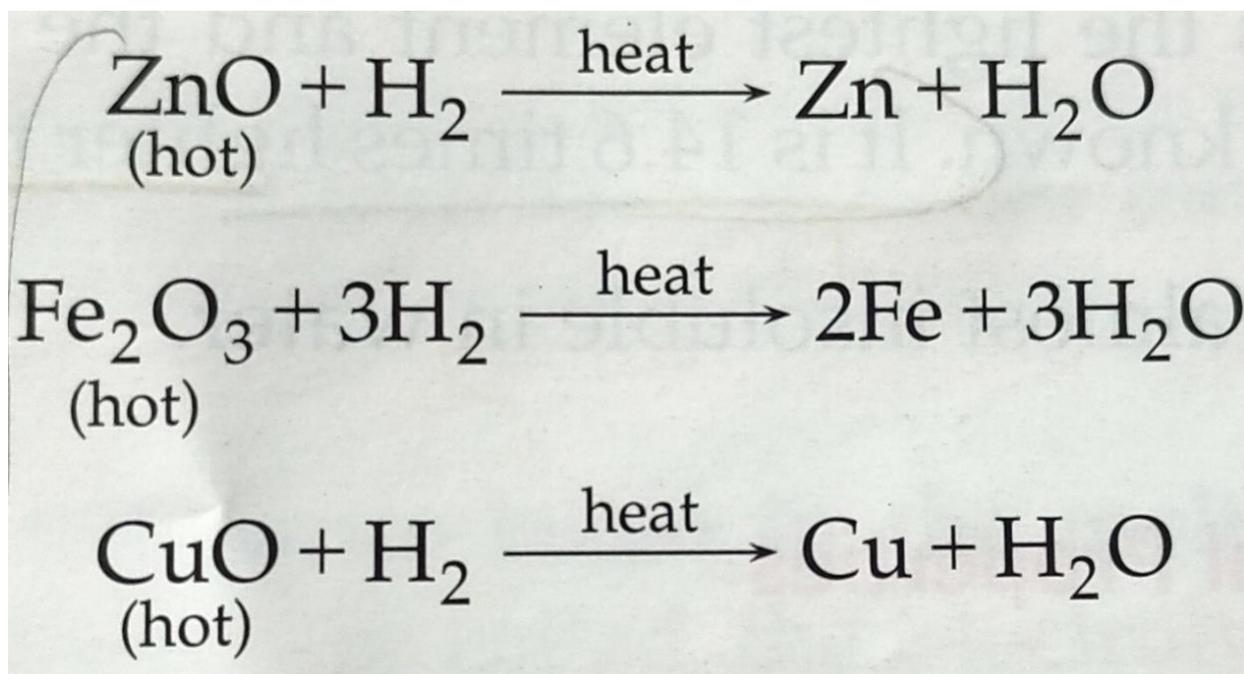
#### Hydrogen

##### Short – answer questions

1. Name the lightest element and lightest gas known.  
Hydrogen
2. In a reaction, one element displaces another from its compound to form a new compound. What is such a reaction called?  
Displacement reaction
3. By which method is hydrogen gas collected? explain your answer.  
Hydrogen gas is collected by the downward displacement of water. it is not collected by downward displacement of air since a mixture of hydrogen and air is explosive.
4. Which gas is collected at the different electrodes in electrolysis of acidified water?  
At cathode – hydrogen  
At anode – oxygen
5. How many times lighter or heavier than air is hydrogen?  
Hydrogen is 14.6 times lighter than air.
6. When kindled, will hydrogen burn in oxygen? name the compound formed, if any and give the balanced equation for the reaction.  
When kindled hydrogen burns in air or oxygen to form water  
 $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
7. State the condition under which hydrogen is made to react with nitrogen in Habers process.  
Temperature- 500 degree Celsius  
Pressure- 200 atm  
Catalyst – Fe
8. Why is hydrogen considered as clean fuel?  
Hydrogen is considered as a clean fuel because its product of reaction is water which does not pollute the environment
9. Give reason why helium is preferred to hydrogen for filling the weather balloon  
helium is the next lightest gas and it is available in plenty and it does not catch fire that is why helium is preferred to hydrogen for filling weather balloon.

##### Long -answer questions

1. Describe how hydrogen is prepared in the laboratory. Explain why nitric acid is not used in the process.  
Hydrogen is prepared in the laboratory by the action of dilute hydrochloric acid or sulphuric acid on granulated zinc.  
 $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$   
As the gas is almost insoluble in water, it is collected by the downward displacement of water. Nitric acid is not used for the process as it forms the oxides of nitrogen.
2. Give three examples to show that hydrogen is a reducing agent



3. Write a short note on oxyhydrogen flame.

In oxyhydrogen flame the two gases Oxygen and hydrogen passing through different pipes mix at a point where the mixture is kindled at a high temperature of 2800 degree Celsius and that flame produce is known as the oxyhydrogen flame.

#### Book work

##### MCQ

1. which of the following pairs of element will react to give a gas that dissolve in water to form an acid.  
Hydrogen and nitrogen
2. with which of the following elements will hydrogen react to give a gas that smells like rotten egg?  
Sulphur
3. Which among the following metals react with water most vigorously?  
Sodium
4. Which of the following metals will not displace hydrogen from water?  
Copper

##### Fill in the blank

1. Are reactive metal like sodium potassium or calcium displaces hydrogen from water.
2. Complete the following equations and balance them.

3. Iron oxide is **reduced** by hydrogen to iron.
4. Magnesium react with steam to form **magnesium oxide** and **hydrogen**.
5. The removal of hydrogen from a substance is called **oxidation**.

**Write true or false**

1. Hydrogen is usually found in free state- **false**
2. The addition of oxygen to a substance is called reduction- **false**
3. The removal of oxygen from a substance is called reduction- **true**
4. Hydrogen can be used as a fuel- **true**
5. Helium is preferred to hydrogen for filling balloons- **true**.

