

# CHEMISTRY STUDY MATERIALS FOR CLASS 10

## (NCERT Based notes of Chapter -01)

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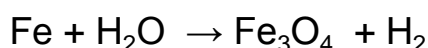
**DATE:- 13/04/2021**

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### CHEMICAL REACTIONS AND EQUATIONS

#### BALANCING A CHEMICAL EQUATION:

To balance the given or any chemical equation, follow these steps:

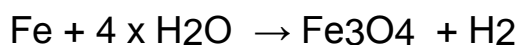


Write the number of atoms of elements present in reactants and in products in a table; as shown here.

Name of atom	No. of atoms in reactant	No. of atoms in product
Iron	1	3
Hydrogen	2	2
Oxygen	1	4

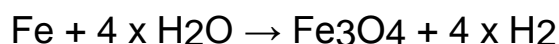
Balance the atom which is the maximum in number; on either side of chemical equation. In this equation, the number of oxygen atom is the maximum on the RHS.

To balance the oxygen one needs to multiply the oxygen on the LHS by 4; so that the number of oxygen atoms becomes equal on both sides.



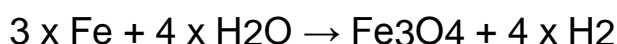
Now, the number of hydrogen atoms becomes 8 on the LHS; which is more than that on the RHS.

To balance it, one needs to multiply the hydrogen on the RHS by 4.



After that number of oxygen and hydrogen atoms becomes equal on both sides. The number of iron is one on the LHS, while it is three on the RHS.

To balance it, multiply the iron on the LHS by 3.

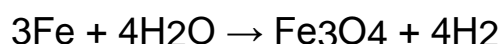


Now the number of atoms of each element becomes equal on both sides.

Thus, this equation becomes a balanced equation.

Name of atom	No. of atoms in reactant	No. of atoms in product
Iron	3	3
Hydrogen	8	8
Oxygen	4	4

After balancing, the above equation can be written as follows.



### **Writing the symbols of Physical States of substances in Chemical equation:**

By writing the physical states of substances a chemical equation becomes more informative.

- Gaseous state is represented by symbol 'g'
- Liquid state is represented by symbol 'l'
- Solid state is written by symbol 's'
- Aqueous solution is written by symbol 'aq'

Writing the condition in which reaction takes place: The condition is generally written above and/or below the arrow of a chemical equation.

Thus, by writing the symbols of physical state of substances and condition under which reaction takes place, a chemical equation can be made more informative.

### **INTEXT QUESTIONS PAGE NO. 6**

**Q1: Why should a magnesium ribbon be cleaned before it is burnt in air?**

**Answer :** Magnesium is an extremely reactive metal. When stored, it reacts with oxygen to form a layer of magnesium oxide on its surface. This layer of magnesium oxide is quite stable and prevents further reaction of magnesium with oxygen. The magnesium ribbon is cleaned by sand paper for removing this layer so that the underlying metal can be exposed to air.

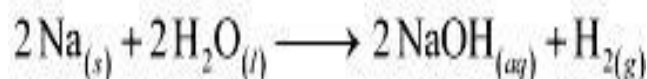
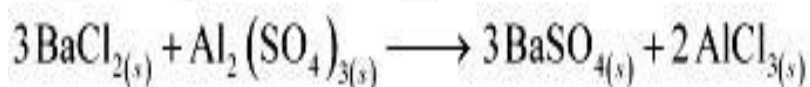
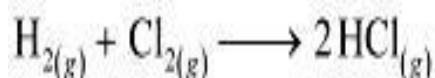
**Question 2: Write the balanced equation for the following chemical reactions.**

**(i) Hydrogen + Chlorine → Hydrogen chloride**

**(ii) Barium chloride + Aluminium sulphate → Barium sulphate + Aluminium chloride**

**(iii) Sodium + Water → Sodium hydroxide + Hydrogen**

**Answer :**

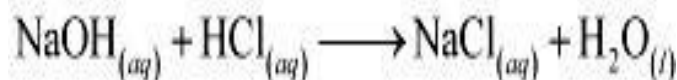
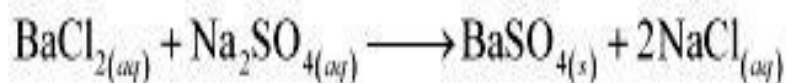


**Question 3: Write a balanced chemical equation with state symbols for the following reactions.**

**(i) Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.**

**(ii) Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water.**

**Answer :**



### **TYPES OF CHEMICAL REACTION**

Chemical reactions can be classified in following types:

- Combination Reaction
- Decomposition Reaction
- Displacement Reaction
- Double Displacement Reaction
- Oxidation and Reduction Reaction

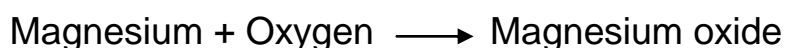
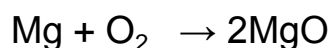
## COMBINATION REACTION

Reactions in which two or more reactants combine to form one product are called **COMBINATION REACTION**

A general combination reaction can be represented by the chemical equation given here.

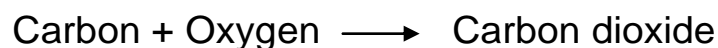
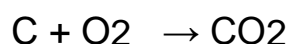


**Example:** When magnesium is burnt in air (oxygen), magnesium oxide is formed. In this reaction, magnesium is combined with oxygen.

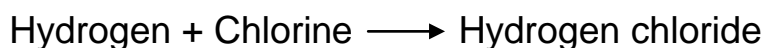
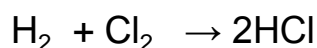


When carbon is burnt in oxygen (air), carbon dioxide is formed.

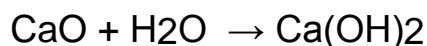
In this reaction, carbon is combined with oxygen.



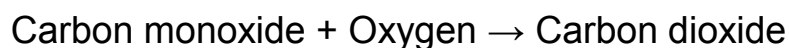
When hydrogen reacts with chlorine, hydrogen chloride is formed.



When calcium oxide reacts with water, calcium hydroxide is formed



When carbon monoxide reacts with oxygen, carbon dioxide is formed.



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