



Chapter - I Chemical Reaction and Equation

Chemistry → Study composition, structure and properties of matter, is called chemistry.

~~#~~ ~~Physical change~~ →

Physical change → A process in which new substance are not formed, is called physical change. Ex. → change in state of matter.

Chemical change → A process in which new substance are formed, is called chemical change. Ex. → Burning of paper, etc.

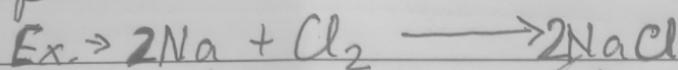
Chemical reaction → A process in which new substance are formed with new physical and chemical properties, is called chemical reaction.

Ex. → Hydrogen and oxygen react to form water.



⇒ Reactant → Substances which are ~~not~~ participation or react in a chemical reaction, are called reactants.

⇒ Product → Substances which are formed in a chemical reaction, are called products.

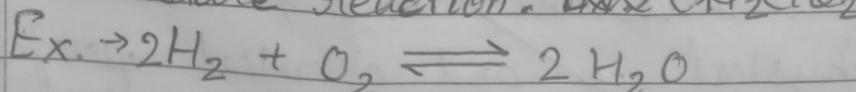


LHS - Reactants

RHS - ~~not~~ Products

⇒ Irreversible reactions → Reactions which cannot be reversed are called irreversible reactions. Ex. → Milk to curd is formed but curd to ~~milk~~ milk is not formed. → Milk → Curd

⇒ Reversible reactions → Reactions which can be reversed are called reversible reaction.

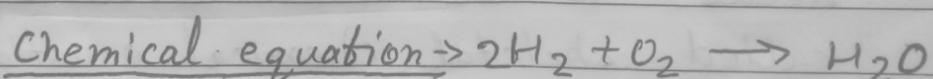


Characteristics of chemical reaction

- (i) Change in colour
- (ii) Change in State
- (iii) Evolution of gas
- (iv) Change in temperature.

Chemical Equations → Representation of chemical reaction in terms of formula or symbol of elements, are called Chemical equation.

Chemical reaction → Hydrogen and Oxygen react to form water

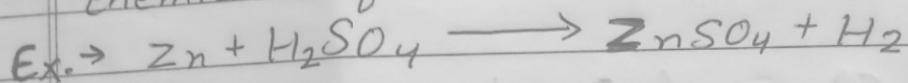


⇒ Advantages of chemical equation →

- ① It makes easy to study a reaction with a single glance.
- ② Requires less time and efforts as compare to chemical reaction.
- ③ Give additional information also which a chemical reaction does not.

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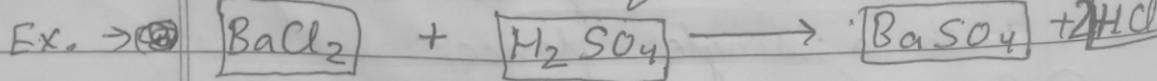
⇒ Balanced Chemical equation → Equations having equal number of atoms on reactants side as well as product side, are called balanced chemical equations.



⇒ Unbalanced Chemical equations →

Equations having unequal number of atoms on reactants side and product side, are called unbalanced chemical equations. It needs to be balanced. It is also called skeletal chemical equations.

⇒ Balancing → Method in which we balance the ^{chemical} equations, called balancing

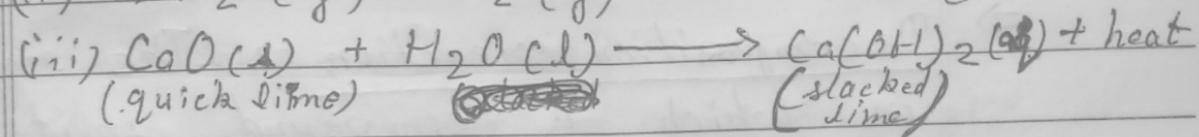
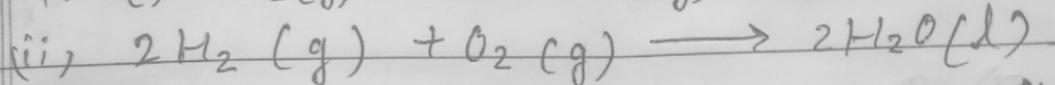
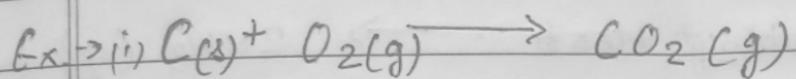


Elements LHS	RHS
Ba 1	1
Cl 2	1
H 2	1
S 1	1
O 4	4



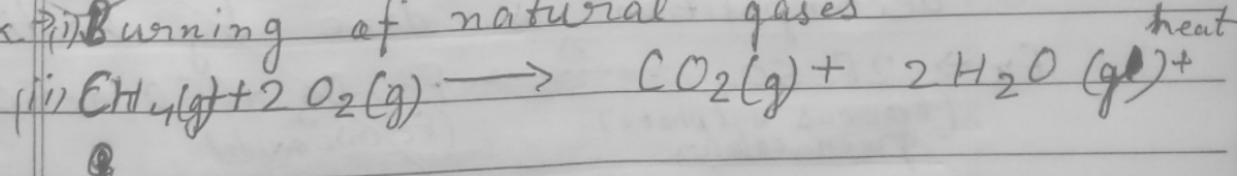
Types of reaction

⇒ ~~Combination reaction~~ → The reactions in which two or more reactant combine to form single ~~more~~ product are called combination reactions.

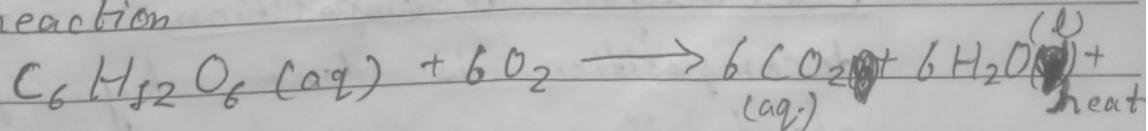


⇒ Exothermic reaction → Reactions in which heat is released alongwith formation of products are called exothermic reactions.

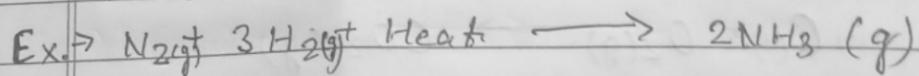
Ex - (i) Burning of natural gases



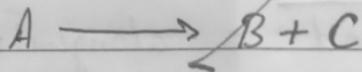
(iii) Respiration is also an exothermic reaction



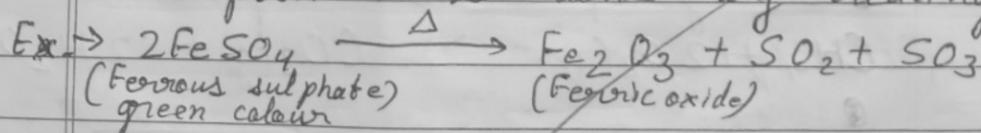
→ Endothermic reaction → The reactions which require energy in the form of light, heat or electricity to break reactants are called endothermic reactions.



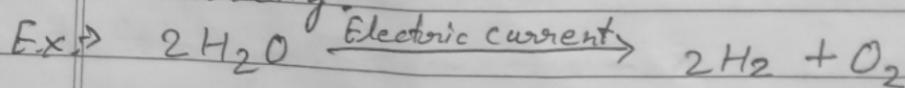
→ Decomposition reaction → The reactions in which a compound splits into two or more simpler substances are called decomposition reaction.



→ Thermal decomposition reaction → When decomposition is done by heating.



→ Electrolytic decomposition → when decomposition is done by passing electricity.



⇒ Photo
when
the
Ex. $\rightarrow 2\text{Ag}$

⇒ Displ
react
elem
elem
displ
Ex. \rightarrow

⇒ Double
in w
by
two

Ex. $\rightarrow \text{Na}_2$

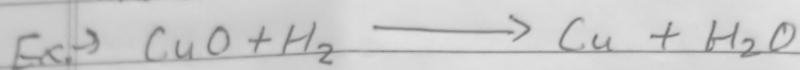
⇒ Oxide
oxig
ator

Ex. $\rightarrow 2\text{C}$

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<p>reactions the form icity to led</p>	<p>⇒ <u>Photolytic decomposition reaction</u> → when decomposition is done by in the presence of sunlight.</p> <p>Ex. $\rightarrow 2\text{AgCl} \xrightarrow{\text{sunlight}} 2\text{Ag} + \text{Cl}_2$</p>
<p>13 (g)</p> <p>e reactions splits into substances reaction.</p>	<p>⇒ <u>Displacement reaction</u> → The chemical reactions in which more reactive element displaces less reactive element from its salts, are called displacement reaction.</p> <p>Ex. $\rightarrow \text{Fe} + \text{CuSO}_4 \longrightarrow \text{FeSO}_4 + \text{Cu}$</p>
<p>bition → when heating. $\text{O}_2 + \text{SO}_3$</p>	<p>⇒ <u>Double displacement reaction</u> → A reaction in which new compounds are formed by mutual exchange of ions between two compounds.</p> <p>Ex. $\rightarrow \text{Na}_2\text{SO}_4 + \text{BaCl}_2 \longrightarrow \text{BaSO}_4 + 2\text{NaCl}$</p>
<p>→ when passing $+ \text{O}_2$</p>	<p>⇒ <u>Oxidation</u> → It is a process of gaining oxygen during a reaction by an atom, molecule or ion.</p> <p>Ex. $\rightarrow 2\text{Cu} + \text{O}_2 \longrightarrow 2\text{CuO}$</p>

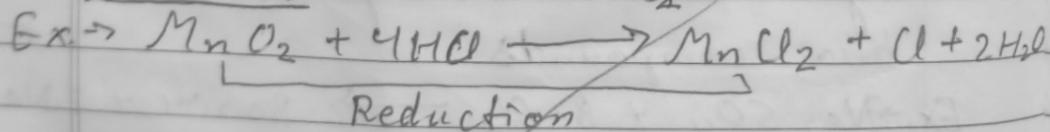
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⇒ Reduction → It is the gain of electron or a decrease in the oxidation state of an atom by another atom, an ion or a molecule.



In this reaction CuO is reduced to Cu and H_2 is oxidised to H_2O , in other words one reactant gets oxidised while the other gets reduced such reactions are called oxidation-reduction reaction or redox reaction.

⇒ Redox reaction (oxidation-reduction reaction) → ~~Redox~~ ~~Oxidation~~ ~~Reduction~~



Reduction

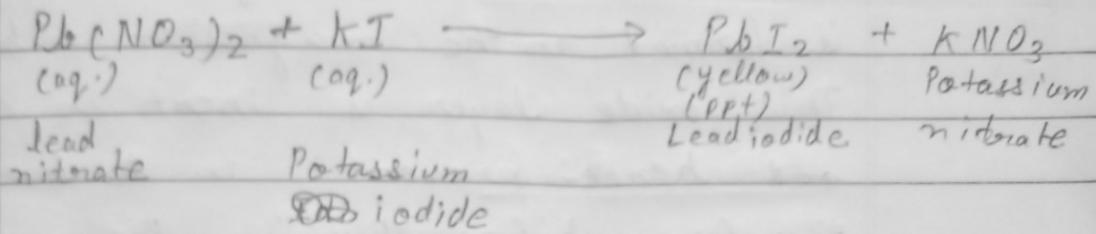
⇒ Redox reaction → The reaction in which the reduction and oxidation takes place simultaneously, is called a Redox reaction



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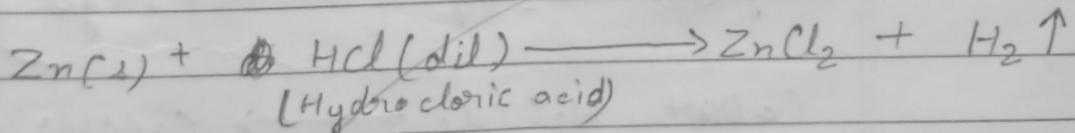
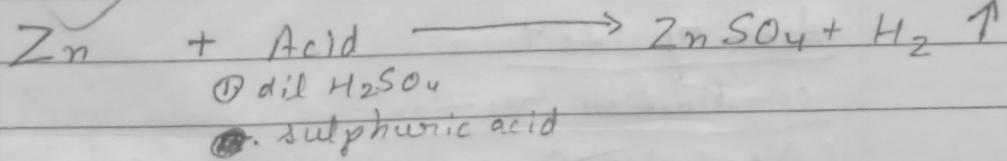
Activity - I.2



Observation

- ① Change in Colour
Yellow colour obtained
- ② formation of precipitate of PbI_2

Activity - I.3



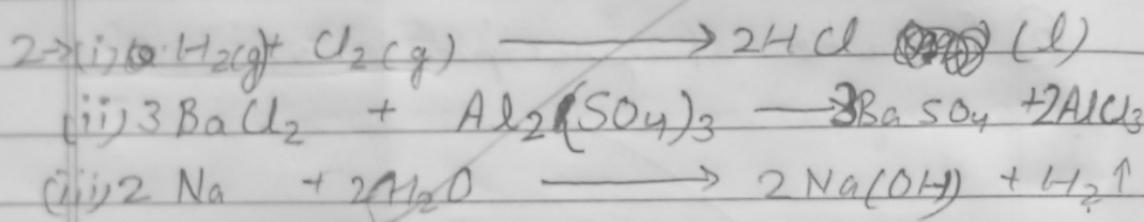
Observation

- ① Bubbles surrounds the Zn granules
- ② Bubbles is of H_2 gas
- ③ The ~~hot~~ conical flask becomes hot, the reaction is exothermic



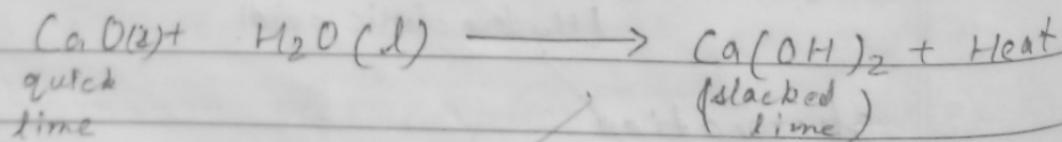
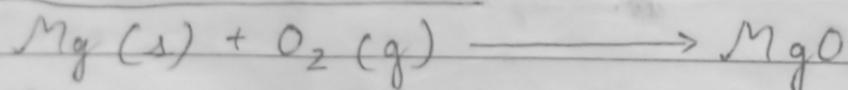
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Pg-6-1 → With the time a layer of oxide is formed on the magnesium ribbon. This oxide layer is inert in nature and hence prevent Mg burning. therefore before burning the magnesium ribbon is cleaned with sandpaper to remove the inert layer.



Activity - I.4

combination reaction

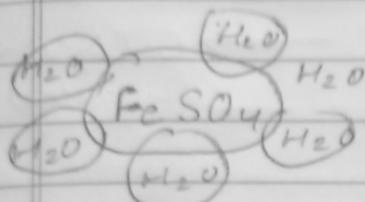


observation

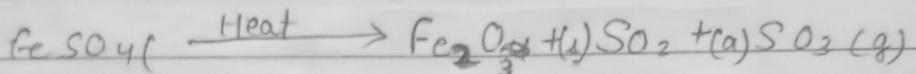
- ① Hissing sound
 - ② container becomes hot
 - ③ Exothermic reaction
 - ④ white washing

Activity - f.5

of oxide
ribbon
in nature
burning.
magnesium
sandpaper



— water of crystallisation



(l) BaSO_4 + AlCl_3
 $\text{BaSO}_4 + \text{AlCl}_3 \rightarrow \text{BaAl}_2\text{O}_4 + \text{H}_2\text{S}\text{O}_4$ or Al_2O_3
observation

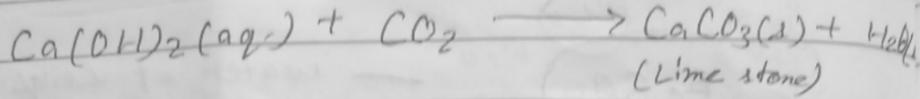
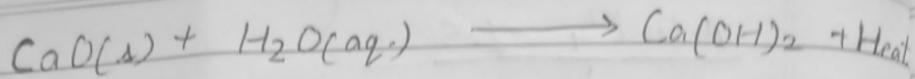
- ① The colour of a crystal was green before heating it changes to brown after heating due to evaporation of water of crystallisation.
- ② Pungent smelling gas was evolved.

Precaution

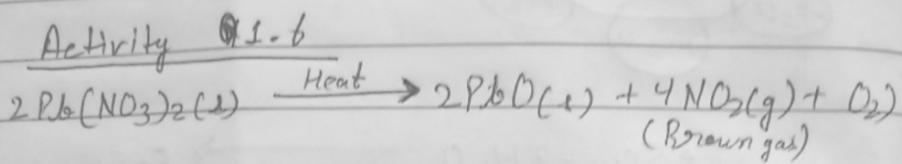
- ③ Do not point the mouth of boiling test tube at your neighbour or yourself



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Activity
Photoly

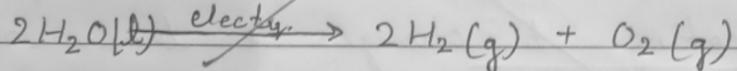


DNA
2 AgCl

Q → why?
Ans. → We k.

Activity - I. 7

Electrolytic decomposition of water



Anode - Oxidation

- Add of negative atom

Cathode - Reduction

~~Activity~~
~~AgCl~~
~~approx~~
~~AgCl~~
~~other p~~
~~1~~

Activity
CuSO₄
(Blue colour)

Hydrogen gas is produced in more amount because the ratio of hydrogen and Oxygen atom in ^{one molecule of} water (H_2O) is $1:2(\text{O:H})$.

since, the number of hydrogen atom is more that's why the amount of hydrogen is more.

Observation
(i) Colour
light g.
(ii) Iron n.



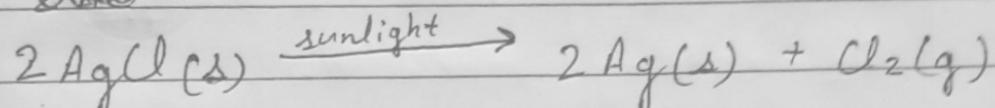
Heat

Heat

Activity - I.8

Photolytic decomposition of AgCl

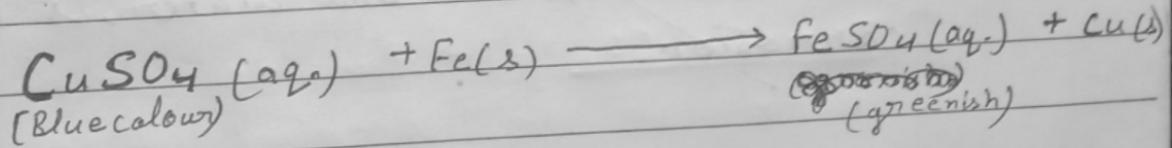
Ques



Q → why AgCl is stored in dark covered bottles?

Ans. → We know that black colour absorbed light approximately. To prevent sunlight from AgCl we covered ~~the~~ bottles so that ~~the~~ photolytic decomposition is not done ^{with} AgCl.

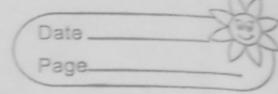
Activity - I.9



Observation

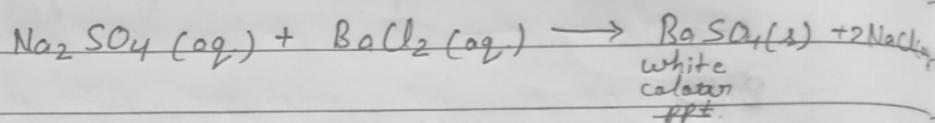
- (i) Colour of CuSO₄ changes from blue to light green.
- (ii) Iron nail becomes brown in colour.

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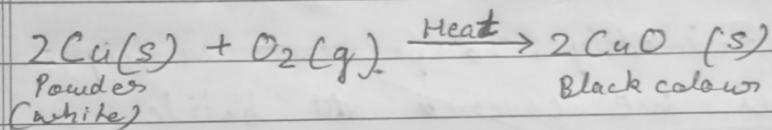
Activity - 1.10

P.g.-10 →
BaCl₂



This
and

Activity - 1.11

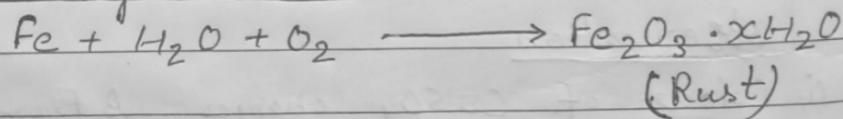


o-1 > A solu
for
formu
(ii) write
'x' n

~~Activity 1.11~~ → Corrosion → Eating away of metals with the action of air and water, is called corrosion

Ans → (i) Q
(ii) C

Rusting of iron



(Brownish colour)

P.g. - 13-10
I → 10
sulph
sulph
displa
That,

⇒ Rancidity → When fat or oil containing food materials get oxidised, this process called rancidity.

CuS

P.g-10 →



+ 2 NaCl(aq)

This is a double displacement reaction.
and exothermic reaction.

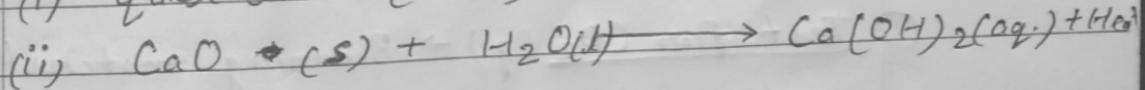
Q-1) A solution of a substance 'x' is used for whitewashing.

(i) Name the substance 'x' and write its formula.

(ii) Write the reaction of the substance 'x' named in (i) above with water.

with

Ans → (i) quick lime (CaO)



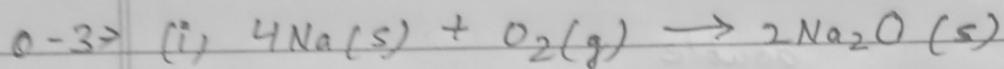
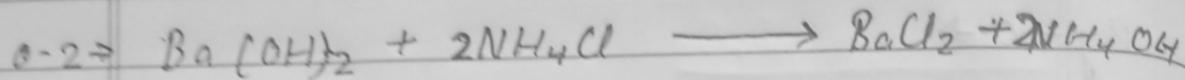
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P.g.-13-①

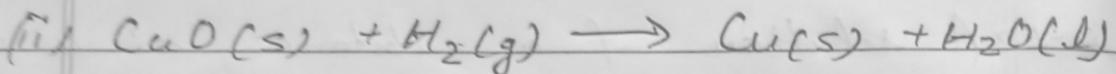
I → because iron nail react with copper sulphate solution and form ferrous sulphate and copper in which iron displaces copper and colour of copper

II → ferrous sulphate is greenish.
That's why colour changed.





In this reaction Na is oxidised and O₂ getting reduced.



In this reaction H₂ getting oxidised and CuO getting reduced.

Decomposition of CaCO_3

Calcium Carbonate



\Rightarrow

① Test for $\text{CO}_2(\text{g}) \rightarrow$ Burning matchstick get extinguish on keeping it at the mouth of test tube

② CO_2 gas when passed through lime water it turns lime water milky

