



CHEMISTRY

BOOKS - BHARATI BHAWAN CHEMISTRY (HINGLISH)

CHEMICAL REACTIONS

Example

1. Balance the equation , $Mg + HCl \rightarrow MgCl_2 + H_2$

A. (i) Each type of atom is counted on each side of the equation .

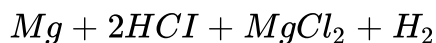
Then we decide which atoms are unbalanced .

	Left side	Right side
Mg	1	1
Cl	1	2
H	1	2

We see that the Cl and H atoms are unbalanced . In case all the

atoms are balanced , there is no need to proceed further, as we already have a balanced equation.

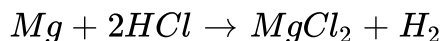
(ii) The most complicated formula of the equation is used to balance atoms other than H and O. In this equation, $MgCl_2$ is the most complicated formula. The equation is already balanced with respect to Mg. So, we can balance Cl by setting 2 just before HCl.



(iii) Each type of atom is now counted on both sides of the arrow to check whether or not the equation is balanced.

	Left side	Right side
<i>Mg</i>	1	1
<i>Cl</i>	2	2
<i>H</i>	2	2

Since all types of atoms are equal in number , the equation is balanced. The balanced equation is



B.

C.

D.

Answer:

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2. Balance the equation, $Mg + H_2O \rightarrow Mg(OH)_2 + H_2$

A. (i) Count each type of atom.

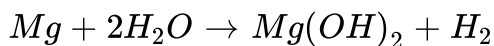
(, Left side , Right side ,), $(Mg, 1, 1)$, $(O, 1, 2)$, $(H, 2, 4)$

H and O are unbalanced.

(ii) The most complicated formula is $Mg(OH)_2$. In order to

balance O, 2 is set just before H_2O

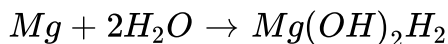
Thus, we get,



(iii) Let us now check if the numbers of atoms on both sides are equal.

	Left side	Right side
<i>Mg</i>	1	1
<i>O</i>	2	2
<i>H</i>	4	4

The equation is now balanced, as we can see. The balanced equation is



B.

C.

D.

Answer:



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3. Balance the equation , $AlCl_3 + Ca(OH)_2 \rightarrow (Al(OH)_3 + CaCl_2$

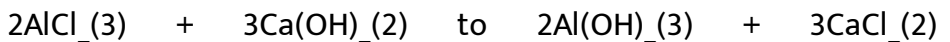
A. (i) Each type of atom is counted

	Left side	Right side
<i>Al</i>	1	1
<i>Cl</i>	3	2
<i>OH⁻</i>	2	3

(ii) The most complicated formula without H and O atoms is

$AlCl_3$. In order to balance Cl, 3 is set just before $CaCl_2$ and 2 is set before $AlCl_3$. To balance Al, 2 is set just before $Al(OH)_3$.

Now, OH is balanced by setting 3 just before $Ca(OH)_2$. Thus,



The balance is now checked. { ("Left Side" , "Right side") , (Al , 2,2)

, (Cl,6,6) , (OH_(-) , 3,6) :}

The equation is balanced.

B.

C.

D.

Answer:



4. Balance the equation , $KClO_3 \rightarrow KCl + O_2$

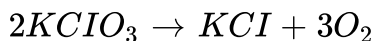
A. (i) Each type of atom is counted.

	Left side	Right side
K	1	1
Cl	1	1
O	3	2

The O atom is unbalanced.

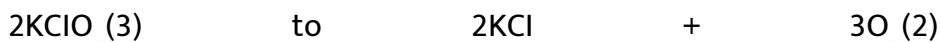
(ii) The most complicated, formula is $KClO_3$. In order to balance

O , 2 is set just before $KClO_3$, and 2 just before O_2 Thus,



The Cl atom becomes unbalanced . So, 2 is set just before KCl.

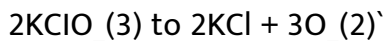
Thus.



(iii) Let us now check if the equation is balanced. { , " Left

side " , " Right side ") , " (K , 2,2) , (Cl , 2,2) ,(O , 6,6) :}

Thus, the equation is balanced. Thus, balanced equation is



B.

C.

D.

Answer:

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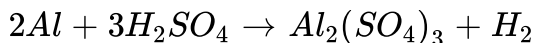
5. Balance the equation , $\text{Al} + \text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + \text{H}_2$

A. (i) Each type of atom or ion is counted .

	Left side	Right side
Al	1	2
H	2	2
SO_4^{2-}	1	3

Al and SO_4^{2-} are unbalanced.

(ii) The most complicated formula is $Al_2(SO_4)_3$. In order to balance Al, 2 is set just before Al. SO_4^{2-} is balanced by setting 3 just before H_2SO_4 . Thus

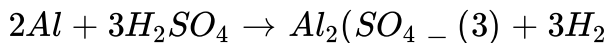


(iii) The balance is now checked.

	Left side	Right side
Al	2	2
H	6	2
SO_4^{2-}	3	3

H remains unbalanced.

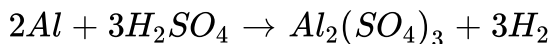
(iv) H is balanced by setting 3 just before, H_2 . Thus ,



(v) Let us check once more if the equation is balanced.

, Left side , Right side), (Al , 2, 2), (H , 6, 6), (SO_4^{2-} , 3, 3) :}

The equation is, thus , balanced . The balanced equation is



B.

C.

D.

Answer:

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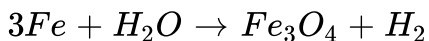
6. Balance the equation , $Fe + H_2O \rightarrow Fe_3O_4 + H_2$

A. (i) Each type of atom is counted on both sides

(, Left side , Right side), (Fe , 1, 3), (H_2 , 2), (O , 1, 4)

(ii) The most complicated formula is Fe_3O_4 . In order to balance

Fe , 3 is set just before Fe on the left side.



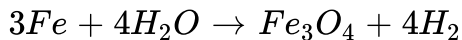
(iii) The balance is now checked.

	Left side	Right side
Fe	3	3
H	2	2
O	1	4

O atom remains unbalanced.

(iv) O is balanced by setting 4 just before H_2 on the right side.

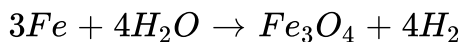
Thus , we get ,



Let us now check the balance

	Left side	Right side
Fe	3	3
H	8	8
O	4	4

The equation is now balanced. i.e the balanced equation is



B.

C.

D.

Answer:



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Pick The Correct Options

1. The reaction $H_2 + Cl_2 \rightarrow 2HCl$ is a

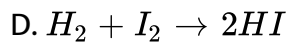
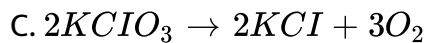
- A. decomposition reaction
- B. combination reaction
- C. double displacement reaction
- D. displacement reaction

Answer:

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2. Which of the following is a decomposition reaction ?

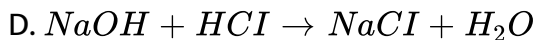
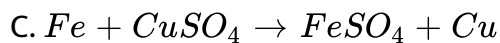
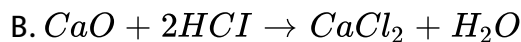
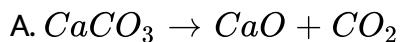
- A. $NaOH + HCl \rightarrow NaCl + H_2O$
- B. $NH_4CHO \rightarrow H_2CONH_2$



Answer: B

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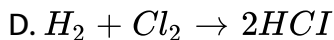
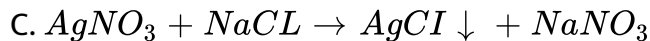
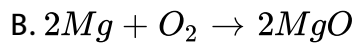
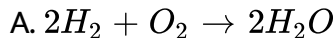
3. which of the following is a displacement reaction ?



Answer: C

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4. Which of the following stands for a double displacement reaction ?

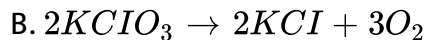
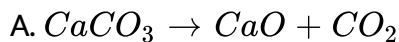


Answer: C

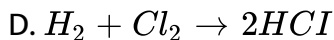


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5. Which of the following is not a decomposition reaction ?



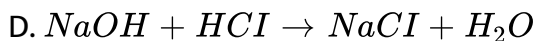
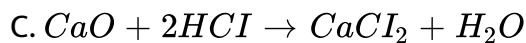
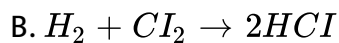
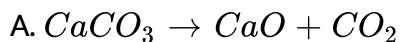
C. Disgestion of food in body



Answer: C

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6. Which of the following is a redox reaction ?



Answer: D

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7. Which of the following statements is incorrect ?

A. In oxidation , oxygen is added to a substance.

B. In reduction , hydrogen is added to a substance

C. Oxidizing agent is oxidized .

D. Reducing agent is oxidized .

Answer: B

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8. Which of the following is a combustion reaction ?

A. Boiling of water

B. Melting of wax

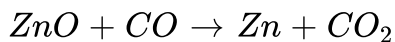
C. Burning of petrol

D. None of these

Answer: C

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9. Which of the statement about the following reactions is correct ?



- A. ZnO is being oxidized.
- B. CO is being reduced
- C. CO_2 is being oxidized
- D. ZnO is being reduced.

Answer: D

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Fill In The Blanks

1. The reaction $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ is a _____ reaction .

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2. $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$ is an example of a ____ reaction

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3. Formation of nitric oxide from nitrogen and oxygen is a ____ reaction

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4. On being heated, baking soda undergoes ____ to give sodium carbonate, water and carbon dioxide.

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5. The reaction in which oxygen is gained is called ____

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6. The reaction in which hydrogen is gained is called _____

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Mark The Statements True Or False

1. Action of heat on ferrous sulphate crystals is an example of decomposition reaction .

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2. In a combination reaction two elements combine to form a compound .

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3. Ammonia and hydrogen chloride react to form ammonium hydroxide.

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4. Digestion of food in our body is an example of reduction reaction.

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5. Copper is more reactive than iron.

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6. When a strip of copper is introduced in a solution of zinc sulphate, zinc is precipitated.

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7. The reaction $FeS + H_2SO_4 \rightarrow FeSO_4 + H_2S$ is an example of double displacement reaction.

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8. Removal of hydrogen from a compound is an oxidizing agent.

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9. In the reaction $4Fe + 3O_2 \rightarrow 2Fe_2O_3$, Fe acts as an oxidizing agent.

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10. The reaction between magnesium and oxygen is an example of combustion.

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11. The minimum temperature required for a substance to burn is called the ignition temperature of the substance.

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12. Formation of vapour from the burning substance is not necessary to produce a flame.

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13. A matchstick gets ignited when inserted in the blue flame of a candle.

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14. What is the type of reaction in which the reactant gives simpler products ?

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Very Short Questions

1. What is the type of reaction in which two or more reactants combine to give one product. ?

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2. In which type of reaction does an exchange of partners take place ?

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3. Give an example of a double displacement reaction (only) reaction with complete balanced equation).

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4. Is copper more reactive than iron ? Give a reaction in support of your answer.

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5. Can a combination reaction be a redox reaction ?

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6. Can a double displacement reaction be a redox reaction ?

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7. Is it possible to have combustion without oxygen ?

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8. what is the minimum temperature at which a substance catches fire called ?

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9. What is the type of reaction in which gain of electrons takes place ?

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10. What type of reaction is represented by the digestion of food in our body?

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11. What happens when a strip of zinc is dipped in a copper sulphate solution ?

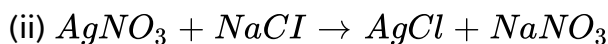
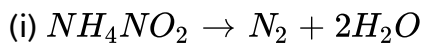
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12. Is burning of a substance possible without a flame ?

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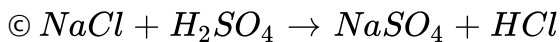
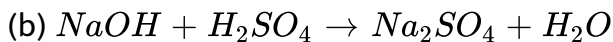
Short Answer Questions

1. What type of reactions are represented by the following equations ?



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2. Balance the following equations:



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3. Give balanced chemical equations for the following reactions :

(a) calcium oxide of a decomposition reaction.

(b) Iron + chlorine \rightarrow ferric chloride

(c) Calcium hydroxide + carbon dioxide \rightarrow calcium carbonate + water

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4. What is a combination reaction ?

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5. Give one example of a decomposition reaction.

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6. What is combination reaction ? Give an example.

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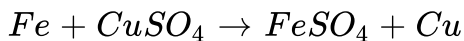
7. How would you show that silver is chemically less reactive than copper?

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8. What is a redox reaction ?

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9. What an iron rod is dipped in a solution of copper sulphate , a redox reaction occurs. :

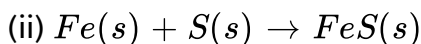
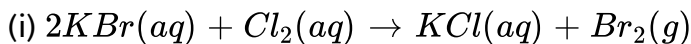


(i) which one is reduced and which one is oxidized ?

(ii) Which one is the oxidizing agent ?

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10. Below are given two chemical reactions :



Which is combination reaction and which is displacement reaction ?

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11. Give one use of decomposition reaction.

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12. What is meant by a displacement reaction ?

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13. Describe any two examples of combustion .

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14. Define ignition temperature of a fuel.

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15. State any two conditions required for combustion to take place.

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16. Explain why flame is observed during the burning of a substance.

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17. Flame

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Long Answer Questions

1. What are different types of chemical reactions ?

Illustrate each type with a suitable example .

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2. Write short notes on

(i) isomerization reactions

(ii) balanced equations

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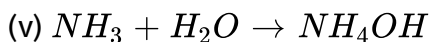
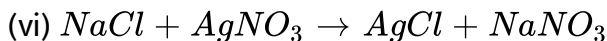
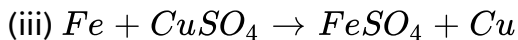
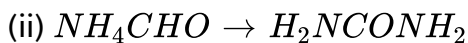
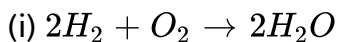
3. What is the difference between a displacement and a double displacement reaction ?

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4. Describe oxidation and reduction in terms of oxygen gain or loss.
Give suitable examples.

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5. classify the following reactions according to their nature.



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6. What do you understand by a balanced chemical equation ?

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7. What do you mean by photochemical decomposition ? Explain giving examples .

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8. Giving suitable examples differentiate between single displacement and double displacement reactions.



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