

Practice Questions - Term I

Date: 21/11/2021

Subject: Chemistry

Topic : Chemical Reactions and Equations

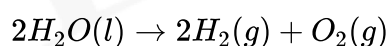
Class: X

1. In electrolysis of water (acidified), the gases that are evolved at anode and cathode respectively are _____ and _____.

- ☐ A. hydrogen and oxygen
- ☒ B. oxygen and hydrogen
- ☐ C. hydrogen and chlorine
- ☐ D. chlorine and oxygen

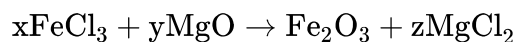
In electrolysis of water (acidified), the gases that are evolved at anode and cathode respectively are oxygen and hydrogen. Hydrogen ions gain electrons from cathode and forms hydrogen gas, oxygen ions gives electrons to anode and forms oxygen gas.

The decomposition reaction of water is:



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2. What will be the values of the coefficients x, y and z if the given reaction is balanced?



☒ A. $x = 2, y = 3, z = 3$

☐ B. $x = 2, y = 4, z = 3$

☐ C. $x = 3, y = 2, z = 2$

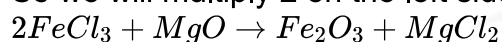
☐ D. $x = 3, y = 2, z = 3$

To find the value of x, y and z, we need to balance the given equation.

Number of Fe atoms on the reactant side: 1

Number of Fe atoms on the product side: 2

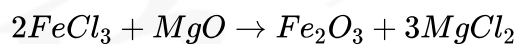
So we will multiply 2 on the left side to FeCl_3 . Hence it will become;



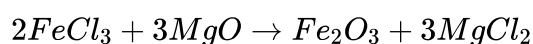
Number of Cl atoms on the reactant side: 6 (i.e. 2×3)

Number of Cl atoms on the product side: 2

So we will multiply 3 on the right side to MgCl_2 . Hence it will become;



Now, the number of Mg atoms are not balanced. In order to balance it, we will multiply 3 to MgO.



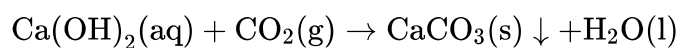
From the above balanced equation the value of x, y and z, w are 2, 3, and 3 respectively.

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3. When carbon dioxide gas is passed through lime water,

- ☒ A. calcium hydroxide is formed.
- ☒ B. white precipitate of CaO is formed.
- ☒ C. white precipitate of CaCO₃ is formed.
- ☒ D. colour of lime water disappears.

When CO₂ is passed through lime water, a white precipitate of CaCO₃ is formed, which turns lime water milky. The reaction occurs as follows:



4. $3\text{MnO}_2(\text{s}) + 4\text{Al}(\text{s}) \rightarrow 3\text{Mn}(\text{s}) + 2\text{Al}_2\text{O}_3(\text{s})$

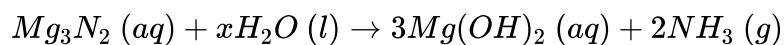
In the above reaction, the oxidising agent is:

- ☒ A. MnO₂
- ☒ B. Al
- ☒ C. Al₂O₃
- ☒ D. Mn

An oxidising agent is a chemical compound that undergoes reduction in a redox reaction. In the given reaction, manganese dioxide is behaving as an oxidising agent as it is getting reduced to manganese.

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5. Estimate the value x to balance the given equation.



☐ A. 2

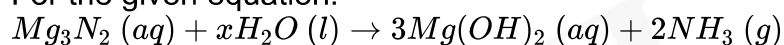
☐ B. 4

☒ C. 6

☐ D. 8

A balanced chemical equation has an equal number of atoms on both the sides of a chemical reaction.

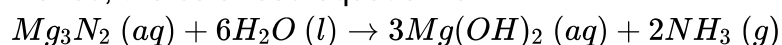
For the given equation:



Reactants		Products	
Elements	No. of atoms	Elements	No. of atoms
Mg	3	Mg	3
N	2	N	2
H	2	H	12
O	1	O	6

Here, Mg and N atoms are balanced at both sides. To balance H and O atoms, the value of x should be 6.

Hence, the balanced equation is:



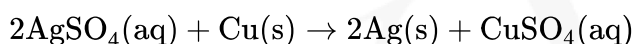
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6. Beakers A, B, and C contain zinc sulphate, silver sulphate, and ferrous sulphate solutions respectively. Copper filings are added to each beaker. Blue colour will appear in which of the following beakers?

- ☐ A. Beaker A
- ☒ B. Beaker B
- ☐ C. Beaker C
- ☐ D. All the beakers

Copper is less reactive than zinc and iron, but is more reactive than silver. Hence, copper displaces silver from its salt solution.

Copper on reaction with silver sulphate forms copper sulphate and silver. The solution colour changes as copper sulphate is blue in colour. The reaction takes place as follows:



Hence colour change will be observed in the case of beaker B.

7. In an experiment, 15 g of a compound X is heated in a closed glass container to give compounds Y and Z. The total mass of the compounds Y and Z is _____ g.

- ☒ A. 15
- ☐ B. 30
- ☐ C. 7.5
- ☐ D. 10

Law of conservation of mass states that the total mass of products formed is equal to the mass of reactants consumed in a chemical reaction.

The mass of reactant = 15 g

From the law of conservation of mass:- The mass of products (new compounds formed) = mass of reactants = 15 g

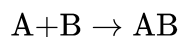
Hence, the answer is 15 g.

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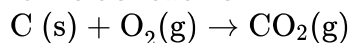
8. Carbon reacts with oxygen to give carbon dioxide. This is an example of:

- ☐ A. Displacement reaction
- ☐ B. Double displacement reaction
- ☐ C. Decomposition reaction
- ☒ D. Combination reaction

If two or more reactants combine to form a single product then it is a combination reaction. The general representation of this reaction is given below:



One mole of carbon reacts with one mole of oxygen to form carbon dioxide. The reaction is as follows:



This is a combination reaction since two reactants are combining to form a single product.

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9. Identify the type of chemical reaction taking place when silver chloride turns black on exposure to sunlight.



- ☒ A. Decomposition reaction
- ☐ B. Displacement reaction
- ☐ C. Combination reaction
- ☐ D. Double displacement reaction

Silver chloride decomposes to two different products i.e. silver and chlorine on exposure to sunlight. The correct balanced chemical equation is:



Such chemical reaction in which two or more products are formed from a single reactant is called a decomposition reaction. It is a decomposition reaction that occurs in the presence of sunlight and hence it is a photochemical decomposition reaction.

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10. **Assertion(A):** Photosynthesis is an endothermic reaction.

Reason(R): Energy gets released in the process of photosynthesis.

- ☒ A. Both A and R are true and R is the correct explanation of A.
- ☐ B. Both A and R are true and R is the not the correct explanation of A.
- ☒ C. A is true but R is false.
- ☐ D. A is false but R is true.

The assertion is true but the reason is false. Photosynthesis is considered an endothermic reaction because the energy in the form of sunlight is absorbed by the green plants.

11. **Assertion(A):** The balancing of chemical equations is based on the law of conservation of mass.

Reason(R): Total mass of reactants is equal to the total mass of products.

- ☒ A. Both A and R are true and R is the correct explanation of A.
- ☐ B. Both A and R are true and R is the not the correct explanation of A.
- ☐ C. A is true but R is false.
- ☐ D. A is false but R is true.

The Law of conservation of mass states that mass can be neither created nor destroyed in a chemical reaction. The total mass of reactants is equal to the total mass of products. Thus, both Assertion and Reason are correct, and Reason is the correct explanation for Assertion.

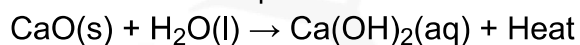
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12. On adding a white solid 'X' to water, a hissing sound is heard and a lot of heat is produced along with the formation a product 'Y'.
 The solution of 'Y' is applied on the walls of buildings during whitewashing. It reacts with carbon dioxide in air to form 'Z'. This Z gives a shiny finishing to the walls after 2-3 days of whitewashing.

(i) The chemical formula of solid 'X' is _____.

- ☒ A. MgO
- ☒ B. CaCO_3
- ☒ C. CaO
- ☒ D. Ca(OH)_2

The white solid 'X' is calcium oxide with chemical formula CaO and is commonly known as quicklime. Calcium oxide reacts with water to form calcium hydroxide(slaked lime) and a lot of heat is also released. The reaction can be represented as:



Solution of slaked lime is used for whitewashing of the walls.

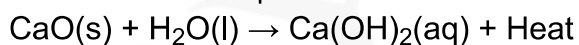
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13. On adding a white solid 'X' to water, a hissing sound is heard and a lot of heat is produced along with the formation a product 'Y'.
 The solution of 'Y' is applied on the walls of buildings during whitewashing. It reacts with carbon dioxide in air to form 'Z'. This Z gives a shiny finishing to the walls after 2-3 days of whitewashing.

(ii) The chemical formula of the product Y is _____.

- ☒ A. Ca(OH)_2
- ☐ B. CaCO_3
- ☐ C. $\text{CaSO}_4 \cdot 1/2 \text{H}_2\text{O}$
- ☐ D. $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

The white solid 'X' is calcium oxide with chemical formula CaO and is commonly known as quicklime. Calcium oxide reacts with water to form calcium hydroxide(slaked lime) and a lot of heat is also released. The reaction can be represented as:



The product 'Y' is calcium hydroxide, Ca(OH)_2 .

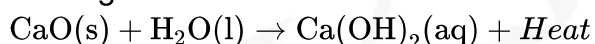
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14. On adding a white solid 'X' to water, a hissing sound is heard and a lot of heat is produced along with the formation a product 'Y'.
 The solution of 'Y' is applied on the walls of buildings during whitewashing. It reacts with carbon dioxide in air to form 'Z'. This Z gives a shiny finishing to the walls after 2-3 days of whitewashing.

(iv) The chemical formula of product Z is _____.

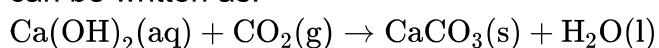
- ☒ A. $MgCO_3$
- ☒ B. Na_2CO_3
- ☒ C. $CaCO_3$
- ☒ D. $NaHCO_3$

Calcium oxide on reacting with water forms calcium hydroxide (Y) according to the given reaction:



A solution of calcium hydroxide(Y) produced in the above reaction is used for whitewashing walls. It reacts slowly with the carbon dioxide in air to form a shiny layer of calcium carbonate(Z) on the walls.

The chemical equation for reaction of calcium hydroxide with carbon dioxide can be written as:



Hence, chemical formula of product Z is $CaCO_3$

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15. **Assertion (A):** Magnesium displaces aluminium from its salt solution.

Reason (R): Magnesium is more reactive than aluminium.

- ☒ A. Both A and R are true and R is the correct explanation of A.
- ☐ B. Both A and R are true and R is the not the correct explanation of A.
- ☐ C. A is true but R is false.
- ☐ D. A is false but R is true.

For a metal to replace another metal from its solution, it has to be more reactive than the other.

The arrangement of metals as per reactivity series is: $K > Na > Ca > Mg > Al > Zn > Fe > Pb > H > Cu > Ag > Au$.

While magnesium being more reactive than aluminium will displace it from its salt solution.

16. On adding a white solid 'X' to water, a hissing sound is heard and a lot of heat is produced along with the formation a product 'Y'.

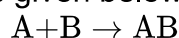
The solution of 'Y' is applied on the walls of buildings during whitewashing.

It reacts with carbon dioxide in air to form 'Z'. This Z gives a shiny finishing to the walls after 2-3 days of whitewashing.

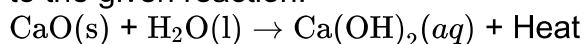
(iii) Formation of Y in this case is an example of _____ reaction.

- ☐ A. displacement
- ☐ B. decomposition
- ☒ C. combination
- ☐ D. redox

If two or more reactants combine to form a single product then the reaction is called as combination reaction. The general representation of this reaction is given below:



Calcium oxide on reacting with water forms calcium hydroxide(Y) according to the given reaction:



So, the formation of Y here in this case is an example of combination reaction.