Work-sheet CBSE-10 Science

Chemical reactions and equations

Fill in the blanks:-

1.Addition of hydrogen in a substance in a reaction is known as_____ reaction.
2.In a _____ reaction two or more substances combine to form a new single substance.
3.Unbalanced reactions are also known as _____
4.Reactions in which heat is given out along with the products are called _____- reactions.
5.Reactions in which energy is absorbed are known as _____ reactions.
6.When as element displaces another element from its compound, a _____ reaction occurs.
7.Those reactions, in which two compounds react by an exchange of ions to form two new compounds, are called _____ reactions
8.Precipitation reactions produce _____ salts.
9.Reduction is the _____ of oxygen or gain of hydrogen.
10.The digestion of food in the body is an example of _____ reaction.
11.The addition of oxygen to a substance is called _____.
12.When calcium carbonate is heated, it decomposes to give_____ and _____.

Solution

1.reduction
2.Combination
3.skeletal
4.Exothermic
5.Endothermic
6.Displacement
7.Double displacement
8.Insoluble
9.Loss
10.Decomposition reaction
11.Oxidation
12.CaO(s) and CO_2 (g)

True/ False:-

1.The number of atoms of each element is conserved in any chemical reaction.
2.Oxidation is the loss of electrons from a substance.
3.Reduction is the gain of electrons by a substance.
4.A complete chemical equation represents the reactants, products and their physical states symbolically.
5.A magnesium ribbon burns with a dazzling flame in air (oxygen) and changes into a white substance, magnesium oxide.
6.Rusting is a double decomposition reaction.
7.The reaction between nitrogen and hydrogen to give ammonia is an example of a combination reaction.
8.Action of heat on ferrous sulphate is an example of decomposition reaction.
9.The formation of Na+ and CI- ions from sodium and chlorine is an example of a redox reaction.

Solution

1. TRUE
2. TRUE
3. TRUE
4. TRUE
5. TRUE
6. FALSE
7. TRUE
8. TRUE
9. TRUE

Very Short Answer Questions:-

Question 1. Write a chemical equation when magnesium metal reacts with aqueous hydrochloric acid to produce a solution of magnesium chloride and hydrogen gas.
Question 2. Can a combination reaction be redox reaction.
Question 3. Why do we apply paint on iron articles?
Question 4. What are the different types of reactions?
Question 5. What is a decomposition reaction ? Give example.
Question 6. Define displacement reaction.
Question 7. What happens when sodium reacts with water?
Question 8. Write the chemical equation and name the reaction when a solution of sodium chloride is mixed with a solution of silver nitrate and a white precipitate of silver chloride is formed.
Question 9. Why does the color of copper sulphate solution change, when an iron nail is dipped in it?
Question 10. Why is photosynthesis considered as an endothermic reaction?
Question 11. Potassium chlorate ($KClO_3$) on heating forms potassium chloride and oxygen. Write a balanced equation for this reaction.

Question 12. Give an example of a chemical reaction characterized the change in temperature.
Question 13. What type of chemical reactions take place when:
(a)Limestone is heating?
(b)A magnesium wire is burnt in air?
(c)Electricity is passed through water?
(d)Ammonia and hydrogen chloride are mixed?
(e)Silver bromide is exposed to sunlight?
Question 14. To balance a chemical equation, can we change the formula of either reactants or products?
Question 15. Why should a magnesium ribbon be cleaned before burning in air?
Question 16. If an of the following reactions occurs spontaneously, write the balanced net ionic equation. If not, write no reaction&
(a)$Pb + Zn^{2+}$ _____ $Pb^{2+} + Zn$
(b)$Fe + H^{+}$ _____$Fe^{2+} + H_2$
(c)$Cu + Ag^{+}$ _____ $Cu^{2+} + Ag$
(d)$Cr + Zn^{2+}$ _____$Cr^{2+} + Zn$
Question 17. Nickel (II) nitrate is prepared by heating nickel metal with liquid dinitrogen tetroxide. In addition to the nitrate, gaseous nitrogen monoxide is formed. Write the balanced equation.
Question 18. Why is the amount of gas collected in one of the test tubes in electrolysis of water double of the amount collected in the other? Name this gas.
Question 19. Write a balanced chemical equation with state symbols for the following reactions:-
i.Solution 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.
Solution
(1)
$Mg + 2HCL \rightarrow MgCl_2 + H_2$

(2) Yes,a combination reaction can be a redox reaction.
In a combination reaction two elements are combined to make a single product.
$2H_2+O_2=2H_2O$ (water's formula)
In this reaction there is reduction of oxygen as there is transfer of electrons from hydrogen to oxygen and there is also oxidation of hydrogen as there is acceptance of electrons by oxygen from hydrogen. Oxygen is the oxidizing agent and hydrogen is the reducing agent.
(3) To prevent it from Corrosion
(4) Combination reactions
Decomposition reaction

Displacement reactions
Double displacement reactions
Oxidation and Reduction reactions

(5) Those reactions in which a compound splits up into two or more simpler substances are known as decomposition reactions.

(6) Those reactions, in which one element takes the place of another element in a compound, are known as displacement reactions.
$cuSO_4 + Zn \rightarrow ZnSO_4 + Cu$

(7) Sodium can react with cold water as it is an extremely reactive metal; when it does,
$2Na + H_2O \rightarrow H_2 + Na_2O$ (Sodium Oxide)
The reaction is very vigorous and exothermic.

(8) $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$
Double displacement and precipitation reaction

(9)When an iron nail dipped in the copper sulphate solution than iron displaces copper from the copper sulphate because iron is more reactive than copper. Therefore the color of the copper sulphate solution changes.

(10) Photosynthesis is considered an endothermic reaction because energy in the form of sunlight is absorbed by the green plants.

(11) $2KClO_3 \rightarrow 2KCL + 3O_2$

(12) (i) $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4$ (ii) $NaOH + HCL \rightarrow NaCl + H_2O$