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Solution 1:
Respiration is an exothermic process because energy is produced during this process.
Solution 2:
A balanced chemical equation has equal number of atoms of different elements in the reactants and products.
Solution 3:
When quicklime is added to water, it forms slaked lime along with evolution of heat. There will be a rise in temperature of the bucket.
Solution 4:
Magnesium ribbon should be cleaned before burning in air to remove the protective layer of basic magnesium carbonate from its surface.
Solution 5:
False.
Solution 6:
Oxygen should be in molecular form, O_2

$2Mg + O_2 \rightarrow 2MgO$

Solution 7:
The symbol (aq) represents aqueous solution in a chemical equation.
Solution 8:
Photosynthesis is an endothermic reaction because sunlight energy is absorbed by green plants during this process.
Solution 9:
(a) Aqueous solution is indicated by the symbol 'aq'.
An exothermic reaction is indicated by writing "+Heat" or "+Heat energy" or "+Energy" on the products side of an equation.
An endothermic reaction is indicated by writing "+Heat" or "+Heat energy" or "+Energy" on the reactants side of an equation.
Solution 10:
(a) $2H_2S + 3O_2 \rightarrow 2H_2O + 2SO_2$

(b) $P_4 + 5O_2 \rightarrow 2P_2O_5$

(c) $CS_2 + 3O_2 \rightarrow CO_2 + 2SO_2$

(d) $2Al + Fe_2O_3 \rightarrow Al_2O_3 + 2Fe$

(e) $BaCl_2 + ZnSO_4 \rightarrow ZnCl_2 + BaSO_4$

Solution 11:
(a) $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$

$2Al + 3CuCl_2 \rightarrow 2AlCl_3 + 3Cu$

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Solution 12:
(a) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

(b) $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$

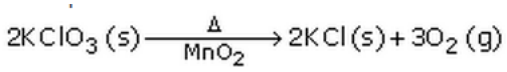
Solution 13:
(i) $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$

(ii) $N_2 + 3H_2 \rightarrow 2NH_3$

Solution 14:
(a) $Ca\ (s) + 2H_2O(l) \rightarrow Ca(OH)_2(aq) + H_2\ (g)$

(b) $2SO_2(g) + O_2\ (g) \rightarrow 2SO_3(g)$

Solution 15:
(i) $4Na + O_2 \rightarrow 2Na_2O$
(ii) $2H_2O_2 \rightarrow 2H_2O + O_2$
(iii) $Mg(OH)_2 + 2HCl \rightarrow MgCl_2 + 2H_2O$.
(iv) $4Fe + 3O_2 \rightarrow 2Fe_2O_3$
(v) $2Al(OH)_3 \rightarrow Al_2O_3 + 3H_2O$
(vi) $2NH_3 + 3CuO \rightarrow 3Cu + N_2 + 3H_2O$
(vii) $Al_2(SO_4)_3 + 6NaOH \rightarrow 2Al(OH)_3 + 3Na_2SO_4$
(viii) $2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O$
(ix) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$
(x) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$
Solution 16:
(a) Conservation of mass
(b) Aqueous; (aq)
Solution 17:
(a) Magnesium Ribbon is heated in the presence of air to form a white powder called magnesium oxide.
(b) When dilute sulphuric acid is poured over zinc granules
(i) there will be a rise in temperature
(ii) evolution of hydrogen gas.
(c) (i) A yellow precipitate is formed.
(ii) There will be a change in color (from colourless to yellow).
Solution 18:
(a) The method of representing a chemical reaction with the help of symbols and formulae of substances involved in it is called a chemical equation.
Example: Zinc metal reacts with dilute sulphuric acid to form zinc sulphate and hydrogen gas. This equation is written as: $Zn + H_2SO_4$ -----> $ZnSO_4 + H_2$
(b) A balanced chemical equation has an equal number of atoms of different elements in the reactants and products. It has equal masses of various elements in the reactants and products.
Example: $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$
An unbalanced chemical equation has an unequal number of atoms of one or more elements in the reactants and products. It has unequal masses of various elements in the reactants and products.
Example: $H_2 + O_2 \rightarrow 2H_2O$
(c) (i) $2NH_3 \rightarrow N_2 + 3H_2$
(ii) $C + CO_2 \rightarrow 2CO$
Solution 19:
$H_2 + CuO \rightarrow Cu + H_2O$
(i) Elements: H_2 and Cu
(ii) Compounds: CuO and H_2O
(iii) Reactants: H_2 and CuO
(iv) Products: Cu
(v) Metal: Cu
(vi) Non-metal: H_2
Solution 20:
(a) The various ways in which a chemical equation can be made more informative are :
(i) By indicating the physical states of the reactants and products.
Example: Gaseous state is indicated by the symbol (g).
$Zn\ (s) + H_2SO_4\ (aq) \rightarrow ZnSO_4\ (aq) + H_2\ (g)$
(ii) By indicating the heat changes taking place in the reaction. For xxample: An exothermic reaction is indicated by writing "+Heat" or "+Heat energy" or "+Energy" on the products side of an equation.
$C\ (s) + O_2\ (g) \rightarrow CO_2\ (g)$ + Heat
(iii) By indicating the "conditions" under which the reaction takes place.
Example: Delta stands for heat which is written over the arrow of the equation.



(b) $Ca(OH)_2$ (aq) + CO_2 (g) → $CaCO_3$ (s) + H_2O (l)

Solution 21:

(a) A balanced chemical equation has an equal number of atoms of different elements in the reactants and products. It has equal masses of various elements in the reactants and products. A chemical equation should be balanced to satisfy the law of conservation of chemical reactions.

(b) $2Al + 3Cl_2 \rightarrow 2AlCl_3$

(c) $2K + 2H_2O \rightarrow 2KOH + H_2$

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Solution 22:

(a) The physical states of the reactants and products are shown by putting the "state symbols" in an equation.

For example: Zn (s) + H_2SO_4 (aq) → $ZnSO_4$ (aq) + H_2 (g)

(b) Zn (s) + 2HCl(aq) → $ZnCl_2$ (aq) + H_2 (g)

(c) $FeSO_4$(aq)+ 2NaOH (aq) → $Fe(OH)_2$ (s) + Na_2SO_4(aq)

Solution 23:

(i) Evolution of gas.

For example: When sodium carbonate reacts with dilute hydrochloric acid, carbon dioxide gas is evolved.

(ii) Formation of a precipitate.

For example: When potassium iodide solution is added to a solution of lead nitrate, yellow precipitate of lead iodide is formed.

Solution 24:

(a) $2Al(OH)_3 + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + 6H_2O$

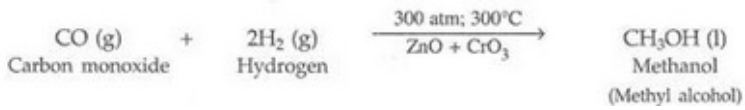
(b) $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$

Solution 25:

(a) $MgCO_3$ (s) + 2HCl (aq) → $MgCl_2$ (aq) + CO_2 (g) + H_2O (l)

(b) 2NaOH (aq) + H_2SO_4 (aq) → Na_2SO_4 (aq) + $2H_2O$ (l)

Solution 26:



The conditions for this reaction to take place are: a pressure of 300 atmospheres (written as 300 atm), a temperature of 300°C, and a catalyst which is a mixture of zinc oxide and chromium oxide (ZnO + CrO_3).

Solution 27:

(a) $2KClO_3$

(s) 2KCl (s) + $3O_2$ (g)

(b) $2Mg + CO_2 \rightarrow 2MgO + C$

Solution 28:

(a) $CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$

(b) NaOH (aq) + HCl(aq) → NaCl (aq) + H_2O (l)

Solution 29:

$4NH_3$ (g)+ $3O_2$ (g) → $2N_2$ (g) + $6H_2O$ (l)

Solution 30:

$6CO_2$ (g) + $6H_2O$ C_6 → $H_{12}O_6$ (aq) + $6O_2$(g)

Solution 31:

$3BaCl_2$(aq) + $Al_2(SO_4)_3$ (aq) → $3BaSO_4$ (s) + $2AlCl_3$(aq)

Solution 32:

$2KNO_3$ (s) → $2KNO_2$ (s) + O_2(g)

Solution 33:

(a) Chemical reactions are the processes in which new substances

with new properties are formed.
For example: When magnesium ribbon is heated, it burns in air to form a white powder called magnesium oxide.
(b)
(i) The chemical reaction between zinc and dilute sulphuric acid.
(ii) The chemical reaction between citric acid and purple coloured potassium permanganate solution is characterised by change in colour (from purple to
colourless).
(iii) The chemical reaction between potassium iodide and lead nitrate is characterised by the formation of a yellow precipitate of lead iodide.
(iv) The reaction between quick lime and water to form slaked lime is characterised by a change in temperature.
(v) When wax is burned, then water and carbon dioxide are formed. Wax is a solid; water is a liquid whereas carbon dioxide is a gas.

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Solution 34:
(a) The various characteristics of chemical reactions are:
(i) Evolution of a gas
(ii) Formation of a precipitate
(iii) Change in colour
(iv) Change in temperature
(v) Change in state.
(b) (i) Evolution of carbon dioxide gas
(ii) Change in colour from purple to colourless
(iii) Formation of white precipitate of barium sulphate
(iv) Change in temperature
(v) Change in state from solid to liquid and gas.
Solution 35:
(a) Those reactions in which heat is evolved are known as exothermic reactions.
The reactions in which heat is absorbed are known as endothermic reactions.
(b) Example of exothermic reaction:
$C (s) + O_2 (g) \rightarrow CO_2 + Heat$
Example of endothermic reaction:
$N_2 (g) + O_2 (g) + Heat \rightarrow 2NO (g)$
(c) Endothermic reactions: Photosynthesis, Electrolysis of water, Decomposition of calcium carbonate.
Exothermic reactions: Burning of natural gas, Respiration.

********** END **********