MADHAV INTERNATIONAL SCHOOL
Affiliated to the Council for Indian School Certificate Examinations (CISCE) - GU031/2014
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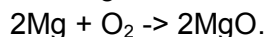## Grade-8 Chemistry

Chapter- 6 METALS & NON METALS
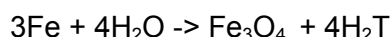
1. What happens in each of the following cases?
   a) Magnesium is burnt in oxygen.
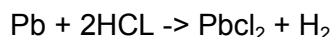   Ans: When magnesium burns in oxygen it produces magnesium oxide with dazzling white light.
      $2Mg + O_2 \rightarrow 2MgO$.
   b) From reacts with steam.
      Ans: From reacts with steam and liberate hydrogen gas and from (III,III) oxide is formed.
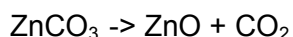 $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2\uparrow$
   c) Lead is added to conc. Hydrochloric acid.
      Ans: Lead forms lead chloride and hydrogen when reacts with cone HCL.
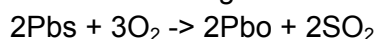 $Pb + 2HCL \rightarrow Pbcl_2 + H_2$
   d) $ZnCO_3$ is heated in the absence of oxygen.
      Ans: ZnCO is converted into ZnO and CO_2 gas is produced.
      $ZnCO_3 \rightarrow ZnO + CO_2$
   e) Pbs is heated in the presence of oxygen.
      Ans: It is roasting of Galena oxide and sulphur dioxide as products
      $2Pbs + 3O_2 \rightarrow 2Pbo + 2SO_2$

- Answer the following in short.
1. Which metal has the highest melting point?
   Ans: Tungsten has the highest melting point.
2. Which metal is best conductor of heat?
   Ans: Silver is the best conductor of heat.
3. What type of reaction occurs when zinc reacts with a solution of lead nitrate?
   Ans: It is displacement reaction when zinc reacts with lead nitrate.
4. What happens when a metal oxide reacts with water?
   Ans: When metal oxide reacts with water metal hydroxide is formed.
5. What happens when a non-metal oxide reacts with water?
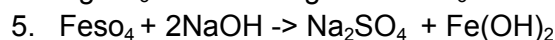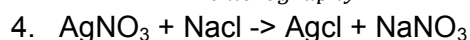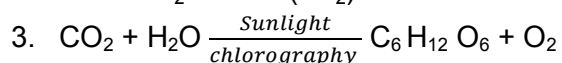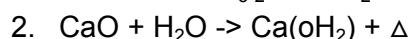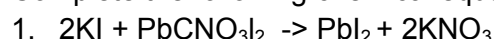   Ans: When non – metal oxide reacts with water it forms acid.
6. What is meant by concentration of ore?
   Ans: The process of removal of gangue from an ore is known as concentration of ore.
7. Write the three methods for concentration of an ore?
   Ans: Hydraulic washing, Magnetic separation, Froth flotation process.

- Complete the following chemical equation and balance them.
   1. $2KI + PbCNO_3I_2 \rightarrow PbI_2 + 2KNO_3$
   2. $CaO + H_2O \rightarrow Ca(oH_2) + \triangle$
   3. $CO_2 + H_2O \xrightarrow[chlorography]{Sunlight} C_6H_{12}O_6 + O_2$
   4. $AgNO_3 + Nacl \rightarrow Agcl + NaNO_3$
   5. $Feso_4 + 2NaOH \rightarrow Na_2SO_4 + Fe(OH)_2$

- Classify the following.
   Reaction as combination displacement precipitation or neutralization rea[n]
   1. $AgNO_{3(aq)} + Nacl_{(aq)} \rightarrow Agcl_{(s)} + NaNO_{3(aq)}$
      Ans: Precipitation.
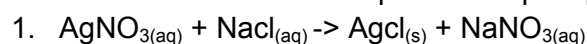
2. $Fe + S \rightarrow FeS$.
   Ans: Combination.
3. $NaoH + HCL \rightarrow NaCl + H_2O$
   Ans: Neutralization.
4. $Cu + 2AgNO_3 \rightarrow CaCNO_3 + 2Ag$
   Ans: Single displacement.
5. $H_2 + cl_2 \rightarrow 2Hcl$
   Ans: Combination.
6. $Cuo + H_2SO_4 \rightarrow Cuso_4 + H_2O$
   Ans: Combination rea^n

- Solve the following.
  A) Calculate the mass of magnesium oxide obtained when 2:49 of magnesium burns in air (Atomic mass of Mg = 24, O = 16).
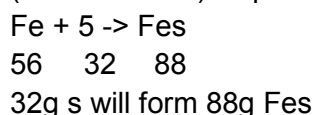 $2Mg + O_2 \rightarrow 2MgO$
     $2 \times 24 \quad 2 \times 16 \rightarrow 2(24 + 16)$
     $48 \quad\quad 32 \quad\quad \rightarrow 2(40)$
     $48 \quad\quad 32 \quad\quad \rightarrow 80$
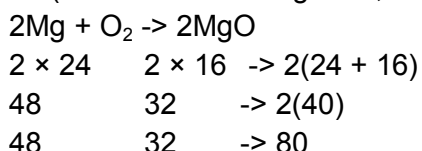
- 48g Magnesium $\rightarrow$ 80 g Mgo
  $2.4g \quad\quad\quad \rightarrow \quad \frac{24 \times 80}{48 \times 10}$
  $\quad\quad\quad\quad\quad = \quad$ 4g Mgo

  Ans: 24g of Mg forms 4g Mgo

  2. What weight of from iron (II) sulphide is formed when 40g of sulphur reacts with iron? (A of Iron = 56) sulphur = 32)
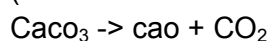 $Fe + 5 \rightarrow Fes$
     $56 \quad 32 \quad 88$
     32g s will form 88g Fes
     $\therefore$ 40g of sulphur =?

     $\frac{40 \times 88}{32}$ = 110g
     40g of s forms 110g Fes.

  3. Calculate the weight of quicklime formed when 500g of limestone is heated.
     (Atomic mass of ca = 40, c = 12, o = 16)
     $Caco_3 \rightarrow cao + CO_2$
     Mwt of $caco_3$
     $1(ca) + 1(c) + 3(0)$
     $1(40) + 1(12) + 3(16)$
     $40 + 12 + 48 = 100g$
     Mwt of Cao
     $1(ca) + 1(0)$
     $= 1(40) + 1(16) = 56g$
     100g limestone
     Gives 56g quicklime
     $\therefore$ 500g limestone gives
     $\frac{500 \times 56}{100}$ = 280g

     Ans: 500g $Caco_3$ gives 280g Cao

- Write the formula.
  1. Silver nitrate.
     Ans: $AgNO_3$
  2. Limestone (Calcium carbonate)

Ans: Caco₃

3. Lime water (Calcium hydroxide)
   Ans: $Ca(OH)_2$
4. Silver chloride
   Ans: Agcl
5. Lead (II) iodide
   Ans: ObI_2
6. Iron (II) sulphide
   Ans: Fes

CHAPTER-6 MEATALS AND NON METALS

- Write four physical properties of metals.
  1. Physical state:
     Ans: Metals are generally solids. E.g. gold, silver, aluminium, copper.
  → Mercury exists as liquid at room temperature Gallium and Calcium.
  → Become liquid when temperature slightly above room temperature.
  2. Melting and boiling point :
     Ans: Metals have general high M.P.
  → Tungsten (W) has the highest M.P.
  → Sodium, potassium, mercury have low M.P.
  3. Metallic lustre:
     Ans: The property of a metal having shinning surf is called its lustre.
- Compare the properties of metals and non – metals on the basis of the following.
  A) Malleability:
  → Metals: Metals are malleable
  → Non metals: Non metals are non malleable.
  B) Electrical conductivity:
  → Metals: Metals are good conductors of electricity. Silver is the best conductor of electricity.
  → Lead is poor conductor of electricity.
- Non metals: Non – metals are bad conductor electricity.
  → However allotrope of carbon graphite is good conductor of electricity.
  C) Reaction with water
  → Metals: Metal reacts with water and forms metal oxide and hydrogen.
  → Non – metals: Only non – metals oxide can react with water.
  D) Reaction with acids:
  → Metal reacts with acid and forms corresponding salt and H_2 gas.
  → Non – metals reacts with conc. acid and form different products.
  4.

Calcinations	Roasting
1. This takes place in absence of air.	1. This takes place i excess amount of air.
2. Calcinations is used for carbonate and hydrated oxide ores.	2. Roasting is used for sulphide ores.
3. Volatile impurities can be removed	3. Moisture organic impuritiesand other volatile impurity are removed.

4. Explain the refining of impure copper metal by electro fining.
   → Electrodes used
     Anode: impure block of copper
     Cathode: thin sheets of copper

   → An aqueous solution of copper sulphate acidified with dir H_2SO
   → Copper is dissolved from the impure anodes on goes into the electrolysing.
   → An equivalent amount of copper from the electrolyte gets deposited on the cathode. The insoluble impurities fall to the bottom of the electrolyte cell in the form of anode mud.
   → Electrode: $Cu^{+2} + 2e^- \rightarrow cu$ (Cathode)
   → Reactions: $Cu \rightarrow Cu^{+2} + 2e^-$ (Anode)

5. What is an alloy? State the composition and uses of the following alloys?
   Ans: The properties of a metal by mixing it at molten state with other metals or non – metals is called alloying. The new product thus obtained is called an alloy.
   A) Brass: Cu 60 – 80%   Zn – 20 – 40 %
   → For making electrical fittings, musical instruments, utensils decorative articles, cartridge cases etc.
   B) Duralumin: Al = 95%, Mg = 0.57, Mn = 0.5%, Cu = 4%, it is used in construction of aircraft automobile.
   C) Solder: Pb – 50%, Sn – 50% for joining metals
   D) Stainless steel: it is used for making utensils, surgical instruments, wrench turbines etc.

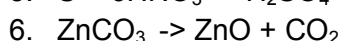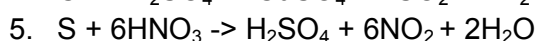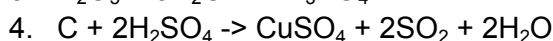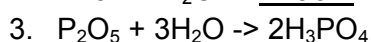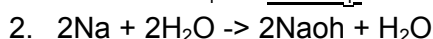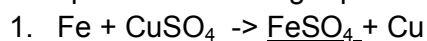6. Write a short note on recycling and conservation of metals.
   Ans: The best way to conserve metals is by recycling the used metals. The method of reusing metals is called recycling of metals. Recycling of metals saves natural resources such as ores and minerals and also saves the money and energy required in extraction of metals from their ores. The recycling process involves collecting metal scarp and reprocessing it to make new products.
   Metals such as copper, aluminium, tin, lead, silver and gold are recycled. Tron and steel scrap is used to make new steel. Recycling of aluminium can save the expensive extraction method of aluminium.

- Complete the following table.

Metal	Name of ore	Forms
1. Aluminium	Bauxite	$Al_2O_3 . 2H_2O$
2. Copper	Copper sulphide	$Cu_2 S$
3. Zinc	Zinc sulphide	$Zn S$
4. Silver	Argentite	$Ag_2 S$
5. Mercury	Cinnabar	$Hg S$

- Complete the following equations.
   1. $Fe + CuSO_4 \rightarrow \underline{FeSO_4} + Cu$
   2. $2Na + 2H_2O \rightarrow \underline{2Naoh} + H_2O$
   3. $P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$
   4. $C + 2H_2SO_4 \rightarrow CuSO_4 + 2SO_2 + 2H_2O$
   5. $S + 6HNO_3 \rightarrow H_2SO_4 + 6NO_2 + 2H_2O$
   6. $ZnCO_3 \rightarrow ZnO + CO_2$

- Answer in short.
  1. Which metal has highest melting point?
     Ans: Tungsten (W) metal has highest melting point.
  2. Which metal is best conductor of heat?
     Ans: Silver.
  3. What type of reaction occurs? When zinc reacts with a solution of lead nitrate?
     Ans: $Zn + PbCNO_3)_2 -> Zn(NO_3)_2 + Pb$
  4. What happens, when metal oxide reacts with water?
     Ans: When metal oxide reacts with water it gives metals hydrochloride.
  5. What happens when a non – metal oxide reacts with water.
     Ans: When a non – metal oxide reacts with water and forms acid.
  6. What is meant by concentration of an ore?
     Ans: The removal of earthy impurities from ore is called concentration of an ore.
  7. Write the three methods of concentration of an ore?
     Ans: Hydraulic washing.
  ➔ Magnetic separation.
  ➔ Forth flotation.
  8. Write two advantages of electro refining.
     Ans: It purities metal up to 99.99%
  ➔ Valuable metals such as gold silver which are present as impurities can be recovered.

CHAPTER – 1 STRUCTURE OF THE ATOM
  1. Write the valency of the following elements.

Metal	Valency
1. Mg	+2
2. Cl	-1
3. Ar	0
4. He	0
5. Na	+1

  2. What is cation?
     Ans: The atom that loses electrons becomes a positively charged ion called cation.
  3. What is electrovalent?
     Ans: The appositively charged ion that holds the attractive force between appositively charged an ion that holds. The ion together is called electrovalent bond.
  4. Explain Bohr's atomic model.
     Ans: Bohr proposed his model of the atom. According to Bohr's model, electrons revolving around the nucleus occupy particular orbits. Which are also called shells.
  ➔ He labelled the shells as K, L, M, N.... starting from the inner most shell.
  ➔ Each orbit or shell is associated with a fixed or definite amount of energy.
  ➔ These shells are called energy levels.

  ➔ Destroy living cells and tissues and even blood cells.
  ➔ Cause genetic disorder by affecting DNA. And cause cancer.
  ➔ If alpha radiation is breathed in, it is easily absorbed by the cells and can damage them.
  ➔ Atomic bomb can destroy all life of the earth,
  5. Write the electronic configuration of element.
  ➔ Na =   [2, 8, 1]
  ➔ Ca =   [2, 8, 8, 2]
  ➔ P   =   [2, 8, 4]

→ S = [2, 8, 6]
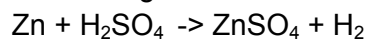→ Cl = [2, 8, 7]
→ He = [2]
→ H = [1]
→ K = [2, 8]

CHAPTER – 5 TRANSFORMATIONS OF SUBSTANCES

1. Give one example each to illustrate the following character tics of a chemical reaction.
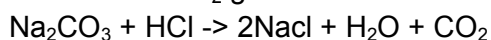   A) Evolution of gas:
- Reaction of dilute H_2SO_4 with Zn metal.
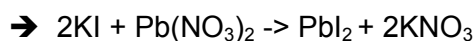 → When Zn granules react with dilute H_2SO_4 hydrogen gas is evolved.
    $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$
- When dilute HCL is added to sodium carbonate brisk effervescence take place with the evolution of CO_2 gas.
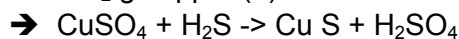 $Na_2CO_3 + HCl \rightarrow 2Nacl + H_2O + CO_2$
   B) Change the color.
     1. Formation of lead iodide:
  → When a solution of lead nitrate and a Sol^n of KI are mixed together a yellow ppt of PbI_2 is obtained.
  → $2KI + Pb(NO_3)_2 \rightarrow PbI_2 + 2KNO_3$
     2. Decomposition of copper (II) carbonate on heating.
  → Copper carbonate is pale green powder. On heating strongly it decomposes to evolve CO_2 g copper (II) oxide.
  → $CuSO_4 + H_2S \rightarrow Cu S + H_2SO_4$
     3. Name all the types of chemical reactions and write on example for each.
    a) Following are the types of chemical reactions.
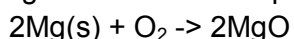 → Combination reaction.
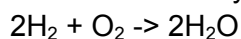 → Decomposition reaction
  → Displacement reaction
  → Double displacement reaction
  → Oxidation and reduction or redox.
- When a piece of magnesium ribbon is burnt or ignited in air. It burns with a white dazzling light to form a white powder of magnesium oxide
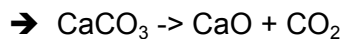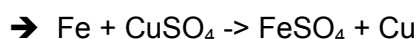 $2Mg(s) + O_2 \rightarrow 2MgO$
2. Combination of hydrogen and oxygen
  $2H_2 + O_2 \rightarrow 2H_2O$
- Decomposition rea^n
  → When limestone is heated, it breaks up into calcium oxide and CO_2
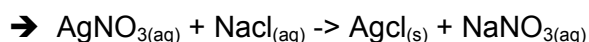 → $CaCO_3 \rightarrow CaO + CO_2$
- Single displacement rea^n
  → Since iron is more reactive than copper it displaces copper from copper (II) sulphate/ solution.
  → $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$
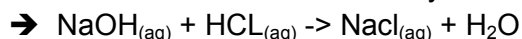- Double displacement rea^n
  → A solution of silver nitrate and sodium chloride react to form a white ppt is formed.
  → $AgNO_{3(aq)} + Nacl_{(aq)} \rightarrow Agcl_{(s)} + NaNO_{3(aq)}$
- Neutralization rea^n:
  → When a solution of sodium hydro reacts with HCL, sodium chloride and water is formed
  → $NaOH_{(aq)} + HCL_{(aq)} \rightarrow Nacl_{(aq)} + H_2O$

- Oxidation rea^n:
  → Addition of O_2 on removal of hydrogen is called oxide.
  → $2Mg + O_2 \rightarrow 2MgO$
- Reduction rea^n:
  → Addition of hydrogen ore removal of oxygen is called reduction of reaction.
  → $H_2 + Cl_2 \rightarrow 2HCL$
- Redox rea^n:
  → A reaction in which oxidation and reduction take place simultaneously.
  → Copper oxide reacts with H_2 to form copper and water.
  → $CuO + H_2 \rightarrow Cu + H_2O$

3. What is displacement reactions? Explain how the principle of based on the reactivity of metal and non – metals.
   → A reaction in which a more reactive element from its compound when reacted together is called a displacement reaction.
   → $A + Bc \rightarrow Ac + B$
   → The principle of displacement reactions is based on the reactivity of metal and non – metals.
   → With the help of activity series one can know which metal will replace others.
   → A highly reactive non – metal can also displace a less reactive non – metal in a reaction. For example, more active halogen can displace ions of less active halogens from their compounds.
   → FYCL > Br > I

4. What are redox reactions? Explain with the help of examples?
   → A reaction in which both oxidation and reduction take place simultaneously.
- Reaction between copper oxide and hydrogen:
  → Copper oxide and hydrogen reacts and then oxygen of copper oxide is removed and form copper and hydrogen is oxidised and form water.

- Reaction between chlorine and hydrogen sulphide:
  → Chlorine reacts with hydrogen sulphide to form hydrogen chloride and sulphur.
  → In this hydrogen is added to chlorine and hydrogen is removed and hydrogen from H_2S.

5. What is electrolyse is? Write there application of electrolyse is?
   Ans: Electrolyse is process by which electricity is passed substance or an aqueous solution of a substance to bring about a chemical change.
- Following are the application of electrolysis.
  → Electroplating: The process of coating one metal with another using on electric current is called electroplating.
  → Electro refining: The process by which metallic impurities are removal from an impure metal by electrolysis is called electro refining.
  → Electro metallurgy: The extraction of a metal from its fused ore by the process of electrolysis is called electro metallurgy.

6. What is balance equation? What does a balence equation give?

Ans: If the number of atoms of each element on both. Sides of the chemical equation are equal then the chemical equation is balanced chemical equation.

- It provides following information.
    - ➔ It helps us to know what is occurring at a molecular or atomic level during a rea^n
    - ➔ It tells us the proportion in mass and in number at the atoms and modules involved in a rea^n.
    - ➔ It agrees with the law of conservation of mass.