7. Metals and Non-metals

Practice Question

Q. 1) Write the answers of the following questions.

1. State the types of the steel.

Ans: a) Mild Steel, b) Medium Steel, c) High Carbon Steel d) Very High Carbon Steel

a) Mild Steel: 1) Contains 0.005% to 0.25% carbon. 2) Contains approximately 0.4% manganese.

Use – less powerful. It's easy to give shape.

b) Medium steel: 1) Contains 0.25% to 0.54% carbon. 2) Contains 0.60% to 1.65% manganese.

Use – Friction resistant, used to make parts of vehicles and rails of railway.

c) High Carbon Steel: 1) Contains 0.55% to 0.95% carbon. 2) Contains 0.30% to 0.90% manganese.

Use – used to make spring and wire.

d) Very High Carbon Steel: 1) Contains 0.96% to 2.1% carbon. 2) Extremely rigid but brittle.

Use – used to make blade, scissor, etc.

2. What is the reaction of metal with the water?

Ans: 1) Hydrogen gas is released when action takes place between metals like sodium and potassium with water.

$2K + 2\ H_2O \rightarrow 2KOH + H_2 + Heat$

2) The aluminium, iron and zinc do not show reaction with cold or hot water but there is reaction with vapour.

$2\ Al + 3\ H_2O \rightarrow Al_2O_3 + 3\ H_2$

$3\ Fe + 4\ H_2O \rightarrow Fe_3O_4 + 4\ H$

3. Write the use of silver metal.

Ans: 1) Silver is mostly used to make jewelleries and also in coins, silver utensils, medical science. 2) Silver chlorite is used to make photo chromatic glass.3) Silver bromide is used in photography. 4) Silver iodine is used in the generation of artificial rain. 5) Silver nitrate (lunar caustic) is used in hair dyes, to make special ink (for election) and for electroplating.

4. Write the uses of Nobel metals.

Ans: 1) In ancient times, gold coins were used in large numbers. 2) Gold metal was used for plating of silver. 3) 24 carat gold was used for rate of exchange of currency. 4) 22 carat gold was used mostly to make various types of attractive jewelleries. 5) Gold metal dissolves in sodium cyanide and potassium cyanide. It is used in salt photography, electroplating and sugar industry. 6) Platinum, palladium metals are used as catalyst. 7) Pure gold is soft. Gold jewellery is made by mixing silver and copper. 8) Silver is used in medicines. 9) Gold and silver are also used to make medals. 10) Silver, gold is used in electronic devices.

5. State the Physical Properties of Metals.

Ans: 1) Physical state: Under ordinary temperature metals stay in solid state. Exception – Mercury and Gallium. Ex. Iron, aluminium, copper, zinc, etc.

2) Lustre: Some metals has lustre. Light gets reflected when the surface of metal is scrubbed. Metals are usually white or grey. Exception – Gold, copper Ex. Platinum, gold, silver, etc.

3) Solubility: The metals usually do not dissolve in solvents.

4) Hardness: Generally metals are hard. Exception – sodium and potassium. Ex. Iron, copper, aluminium, etc.

5) Conduction of heat: Metals are good conductors of heat. Because the composition of particles in metals are very thick. Ex. Silver, copper, aluminium, etc. Exception – Lead.

6) Conduction of electricity: Metals are good conductor of heat. Ex. Silver, gold, copper, aluminium, etc. Exception – Lead.

7) Ductility: The property of making wires from metals is called ductility. Ex. gold, silver, platinum, copper, tungsten, etc.

8) Malleability: The property of making sheet from metals is called malleability.

9) Sonority: The property of producing sound on striking on hard surface is called sonority. Metals are sonorous. Ex. copper, iron, etc.

10) Melting and Boiling points: Metals have high melting points and boiling points. Ex. gallium, sodium, mercury, potassium.

6. State physical properties of non-metals.

1) Physical state: At ordinary temperature non-metals occur as solids, liquids and gases.

2) Lustre: Non-metals do not have lustre, some non-metals are colourless while others have different colours.

Except: carbon in the form diamond.

3) Solubility: Non-metals can dissolve in any solvent and again that dissolved non-metal can be obtained by doing evaporation of that solvent.

4) Toughness: Non-metals are brittle and soft.

Exception: carbon in the form diamond.

5) Conduction of heat: Non-metals are bad conductors of heat.

6) Conduction of electricity: Non-metals are bad conductors of electricity. Exception: carbon in the form of graphite, gas carbon.

7) Ductility: Wires cannot be made from non-metals.

8) Malleability: Sheet cannot be made from non-metals.

9) Sonority: Non-metals are not sonorous.

10) Melting and boiling points: Non-metals have low melting points and boiling points. Exception: carbon – melting point 3550°C, boiling point 3825°C.

7. Which are the alloys of aluminium metal?

Ans: 1) Duralumin: components – 95% aluminium + 3% copper + 1% magnesium + 1% manganese

Uses: these alloys are great shock resistant and stress resistant so they are used in aircraft spare parts, vehicles spare parts, templates, utensils in kitchen and for making metro train.

2) Magnalium: components – 95% aluminium + 5% magnesium

Uses: these alloys are light in weight, strong and corrosive so they are used for making aerial vehicles, scales and house appliances.

3) Alnico: components – 8-12% aluminium + 15-26% nickel + 5-24% cobalt + 6% copper.

Uses: these are magnetic alloys. Various types of permanent magnets can be made from these and they are used in various electrical appliances.

Ex. used in electric motors, electric guitar, microphone, loudspeakers.

Q. 2) Write reasons for the following.

1. Aluminium metal is used in ship building.

Ans: Aluminium metal is extremely light. The oxidisation of this metal does not take place in saline water. Therefore, aluminium metal is used in ship building.

2. Tinning is done for copper and brass utensils.

Ans: 1) The green layer accumulates on copper and brass utensils due to erosion. 2) The green layer is poisonous. 3) Tinning is done for copper and brass utensils to avoid accumulation of green layer.

Q. 3) Write the uses of mercury metal.

Ans: 1) The liquid form mercury metal is used in thermometer, barometer.

2) Mercurous chloride (calomel) is used to make medicines and electrode.

3) Mercuric chloride is extremely toxic compound.

Q. 4) Write the properties of non-metal phosphorous.

Ans: a) Yellow phosphorous: 1) It is soft like wax so can be easily cut by knife. 2) Colour is white but becomes yellow due to light. 3) Its smell is like garlic still it is toxic. 4) Density is $1.8\ \mathrm{gram/cm^3}$. 5) Melting point is 30°C and boiling point is 44°C. 6) It is insoluble in water and dissolves in solutions like carbon disulphide, chloroform and benzene. 7) It is kept under water, because it burns if kept in the air.

b) Red phosphorous: 1) Its colour is brown like brick. 2) It does not have smell so it is nontoxic. 3) Its density is $32.35\ \mathrm{gram/cm^3}$4) Its melting point is 260°C. 5) It is insoluble in water. 6) It does not burn if kept in air.

Q. 5) Write definitions of the following.

1. Metallic

Ans: The minerals from which we get beneficial metals are called as metallic.

2. Minerals

Ans: The naturally found metals and collection of their compounds in the ground are called as minerals.

3. Noble metals

Ans: The metals are found in free and combined state in nature. Metals found in Free State are less active so does not get affected by of air and water on them. They are called as noble metals.

4. Allotropy

Ans: The property of solids form non-metals to exist in two or more crystal form is called as allotropy.

5. Reduction

Ans: The chemical process of removing oxygen from metallic oxides is called as reduction.

6. Alloy

Ans: A homogeneous mixture of two or more metals or a homogeneous mixture metal with non-metals is called alloy.

7. Metallurgy

Ans: The branch of science which studies extraction, finishing and alloying of metals from metallic using various physical and chemical methods is called metallurgy.

Question. 6) Identify the different term from the following.

1. Iron, Copper, Aluminium, Sodium

Ans: Sodium (this can be cut by knife)

2. Steel, Iron, Tungsten steel, Brass

Ans: Iron (All others are alloy)

Question. 7) Write whether true or false.

1. Mercury is a metal.

Ans True

2. The oxides of non-metals are acidic.

Ans: True

3. Gold is found in element form in nature.

Ans: True

4. The density of non-metals is more.

Ans: False (The density of non-metals is low.)

5. The metals are bad conductors of heat and electricity.

Ans: False (The metals are good conductors of heat and electricity.)

Q. 8) Write the answers in one sentence.

1. Who invented phosphorous?

Ans: The German scientist Brand invented phosphorous.

2. The tip of the pen which is used for the writing is made from what?

Ans: The tip of the pen which is used for the writing is made from platinum.

3. Which are the allotropes of phosphorous?

Ans: The allotropes of phosphorous are,

1) White or yellow phosphorous2) Red phosphorous

3) Scarlet phosphorous 4) Black phosphorous

5) Purple phosphorous

4. What is the rolled gold used for?

Ans: Rolled gold is used to make cheap ornaments.

5. State two uses of metalloids.

Ans: 1) Boric acid is used in antiseptic medicines.

2) Germanium is used in transistor, light dry cell, solar cell, etc.

6) Write the names of the metals which are found in Free State.

Ans: The metals found in Free State are gold, silver, platinum, copper and bismuth.

7) Write the names of the metals which are found in combined state.

Ans: Bauxite, Hematite, Magnetite, etc. metals are found in combined state.

8) What is soil impurity?

Ans: The impure substances like sand, soil and rocks in metallic are called as soil impurity.

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