QUESTION PAPER 1

Class 8 Chapter 4 – Materials Metals and Non-Metals Important Questions with Answers

Q1: Name two soft metals which can be cut with a knife.

Answer:

Metals that can be cut with a knife are sodium and potassium.

Q2: Which non-metal is essential for our life and all living beings inhale it during breathing?

Answer:

Oxygen is a non-metal that plants and animals use to breathe. It is necessary for our survival as well.

Q3: Name two major non-metals which are present in fertilisers and enhance the growth of plants.

Answer:

Nitrogen and phosphorus are non-metals that are found in fertilisers and help plants grow.

Plants require nitrogen to produce a lot of leaf growth and vibrant green colour. Plants utilise phosphorus to help them create new roots, seeds, fruit, and blooms. Phosphorus is a chemically very stable element.

Q4: Which non-metal is used to disinfect water?

Answer:

Chlorine is a non-metal that is used in water disinfection.

Q5: A purple coloured non-metal forms a brown solution in alcohol which is applied on wounds as an antiseptic. Name the non-metal.

Answer:

Iodine is a non-metallic element with a dark violet natural colour that is essential to human metabolism. As a pre and postoperative antiseptic, iodine is commonly used in an alcohol solution (called tincture of iodine) or as Lugol's iodine solution.

Iodine is bactericidal, fungicidal, tuberculocidal, virucidal, and sporicidal in a short amount of time.

Q6: Zinc sulphate forms a colourless solution in water. Will you observe any colour on adding copper turning in it?

Answer:

Copper has a lower reactivity. As a result, adding it to a zinc sulphate solution does not remove zinc from the salt solution. As a result, the displacement reaction does not occur.

Q7: Why are bells made of metals?

Answer:

Metals, rather than wood, are used to make bells because metals can emit sound when struck with a solid object, i.e. they are Sonorous. As a result, when the bell rings, we will be able to hear it well.

Q8: Which liquid metal is used for making thermometers?

Answer:

At room temperature, mercury is the only metal in a liquid state. Mercury is used in thermometers for its high coefficient of expansion. Thermometers, barometers, manometers, sphygmomanometers, float valves, mercury switches, mercury relays, fluorescent lamps, and other devices all contain mercury.

Mercury is used in a variety of items, including switches and batteries since it is a good conductor of electricity.

Q9: Which of the following metals can displace the other two metals from their salt solutions? zinc, iron, copper

Answer:

The given reactive order is Zinc > Iron > Copper

As shown, zinc is the most reactive metal and copper is the least reactive metal of the three metals, with iron's reactivity falling in between these. As a result, zinc metal can displace the other two metals from salt solutions.

Short Answer Type Questions

Q1: Paheli bought a statue made of copper. To her surprise, it acquired a dull green coating after a couple of months. Explain the reason.

Answer:

The green material is a mixture of copper hydroxide and copper carbonate that forms when copper reacts with moist air (water, oxygen and carbon dioxide).

A copper statue develops a dull green coating after being exposed to moist air for an extended period of time. Copper Hydroxide[$Cu(OH)_2$] and Copper Carbonate[$CuCO_3$] are generated when copper combines with damp air, resulting in a dull green covering. This green coating is generally referred to as 'Basic Copper Carbonate,' and the process of green coating production on copper objects is referred to as copper corrosion.

Q2: In Fg 4.1 you find that the bulb glows when an iron nail is placed between two ends of wire. Complete the following sentences on the bases of this fact.

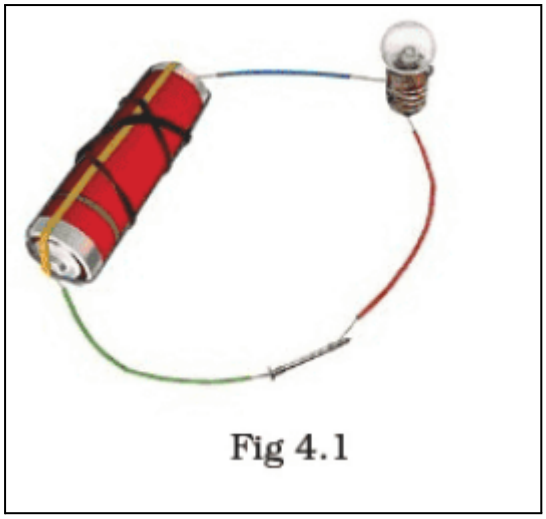

Fig 4.1

(a) _____ is a metal.

(b) Metals are good _____ of electricity.

Answer:

(a) Iron is a metal.

(b) Metals are good conductor of electricity.

Q3: If in Fig. 4.1 iron nail is replaced by a wooden stick, will the bulb glow or not? Justify your answer.

Answer:

Because wood is a poor conductor of electricity, the bulb will not glow.

Q4: Paheli prepared a blue coloured solution of copper sulphate in beaker A and placed an iron nail in it. Boojho prepared a yellowish-green solution of ferrous sulphate in beaker B and placed a copper wire in it. What changes will they observe in the two beakers after an hour?

Answer:

- A reddish-brown layer of copper will form on the iron nail in beaker A, and the blue solution will turn yellowish-green.
- Beaker B, on the other hand, shows no signs of alteration.

Because Fe is more reactive than Cu, it displaces the Cu from the $CuSO_4$ solution in beaker A. As a result of the production of $FeSO_4$, the solution's blue colour changes to green. Because Cu is less reactive than Fe, it cannot displace Fe from $FeSO_4$ solution in beaker B.

Q5: A doctor prescribed a tablet to a patient suffering from iron deficiency. The tablet does not look like iron. Explain.

Answer:

The tablet is not composed of iron metal, but rather of iron salt.

Iron is taken orally in the form of ferrous sulphate, ferrous gluconate, or amino acid chelate tablets. Tablets cannot resemble iron, but they do contain iron metal in various forms to compensate for the deficiency. Iron supplements, often known as iron salts or iron pills, are a type of iron supplement that is used to treat and prevent iron deficiency, such as anaemia.

Ferrous salts (ferrous fumarate, ferrous sulphate, and ferrous gluconate) are the most readily absorbed iron supplements and are frequently used as a standard for other iron salts.

Q6: Match the substances in Column A with their applications given in Column B.

Column A	**Column B**
(Substance)	**(Application)**
(a) oxygen	**(i) for making crackers**
(b) copper	**(ii) for disinfecting water**
(c) sulphur	**(iii) all living beings inhale during breathing**

(d) iron	**(iv) for making electric wires**
(e) chlorine	**(v) for making rails**

Answer:

(a) oxygen – (iii) all living beings inhale during breathing

(b) copper – (iv) for making electric wires

(c) sulphur – (i) for making crackers

(d) iron – (v) for making rails

(e) chlorine – (ii) for disinfecting water

Long Answer Type Questions

Q1: Some of the following statements are incorrect. Find the incorrect statements and correct them.

- (a) The property of metals by virtue of which they can be drawn into wires is called ductility.
- (b) Metals are good conductor of electricity but poor conductor of heat.
- (c) Articles made of metals produce ringing sound when struck hard.
- (d) Oxides of non-metals and metals are acidic in nature.
- (e) A less reactive metal replaces a more reactive metal from its salt solution in water.

Answer:

Statements b, d, and e are not correct.

(b) Metals are good conductor of electricity but poor conductor of heat.

Because the atoms in metals form a matrix through which outside electrons can easily travel, metals are good conductors of both electricity and heat.

(d) Oxides of non-metals and metals are acidic in nature.

Metal oxides are basic because when they dissolve in water, they produce salt and water. OH- is found in metal oxides. As a result, ions are basic in nature. Sulfur dioxide and other non-metal oxides contain H+ ions, which dissolve in water to form acidic solutions.

(e) A less reactive metal replaces a more reactive metal from its salt solution in water.

Metals at the top of the reactivity series are extremely reactive and have the ability to displace metals at the bottom of the series.

Q2: Iron is more reactive than copper. Can you write an activity to show this?

Answer:

Iron is more reactive than copper can be shown by the below activity.

- Copper sulphate solution, an iron nail, and a test tube are all required materials.
- Pour copper sulphate solution into the test tube. Drop the iron nail on top of it and wait for the reaction.
- Observation: The solution changes colour to blue. When the nail comes in contact with the solution, it turns a reddish-brown colour.
- Conclusion- The following equation can be used to understand the preceding process:

$Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

This type of reaction is termed as displacement reaction.

Q3: Fill in the blanks to complete the following paragraph.

The name of the product formed in the reaction of sulphur and _____ is sulphur dioxide gas. When sulphur dioxide is dissolved in _____, sulphurous acid is formed. The sulphurous acid turns _____ litmus paper to _____. Generally oxides of _____ are acidic in nature. After completing the paragraph write two questions which you can raise on the basis of this information.

Answer:

The name of the product formed in the reaction of sulphur and **Oxygen** is sulphur dioxide gas. When sulphur dioxide is dissolved in **water**, sulphurous acid is formed.

The sulphurous acid turns **blue** litmus paper to **red**. Generally, oxides of **non-metals** are acidic in nature.

Two questions that can be raised on the basis of this information are:

(i) When sulphur combines with oxygen, what gas is produced?

(ii) What is the nature of non-metal oxides?

Q4: Find out the names of three metals and three non-metals from the box given as Fig 4.2.

A	X	T	M	S	P	K	L	G
X	T	S	U	L	P	H	U	R
I	L	R	H	M	N	D	I	L
C	I	R	O	N	S	E	J	K
A	L	U	M	I	N	I	U	M
R	M	U	Q	T	R	S	T	U
B	N	P	C	O	P	P	E	R
O	X	Y	G	E	N	V	W	X
N	Y	Z	T	A	B	G	H	K

Fig 4.2

5. Complete the crossword given in Fig. 4.3 with the help of the clues.

Answer:

Three of the metals are aluminium, iron, and copper

Three of the non-metals are oxygen, sulphur, and carbon.

Q5: Complete the crossword given in Fig 4.3 with the help of the clues.

Across

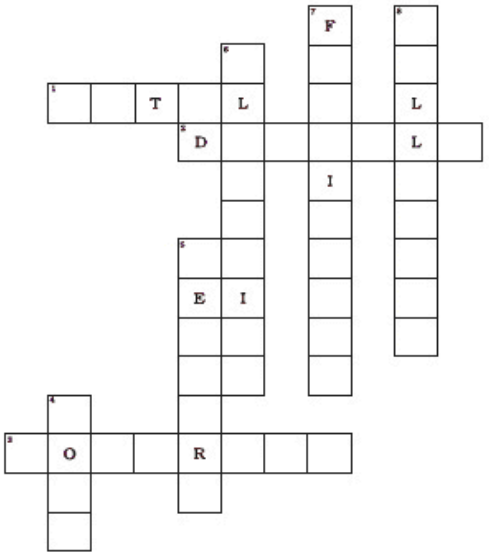

Fig 4.3

Across

- 1. Which is generally hard, ductile, malleable and sonorous.
- 2. A metal is called so it can be drawn into wires.
- 3. Metal bells are used because of this property.

Down

- 4. A metal generally used for making jewellery.
- 5. A metal which is liquid at room temperature.
- 6. A metal which reacts with acid as well as base to form hydrogen gas.
- 7. Substances used to enhance the growth of plants.
- 8. Property by virtue of which metals can be beaten into thin sheets.

1. Which is generally hard, ductile, malleable and sonorous.

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4. A metal generally used for making jewellery.

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7. Substances used to enhance the growth of plants.

8. Property by virtue of which metals can be beaten into thin sheets.

Answer:

Across

1. METAL

2. DUCTILE

3. SONOROUS

Down

4. GOLD

5. MERCURY

6. ALUMINIUM

7. FERTILISER

8. MALLEABLE

CBSE Class 8 Science Chapter 4 MCQ Type Questions

Q1. Which from the following is the most reactive metal?

(a) calcium

(b) potassium

(c) silver

(d) copper

Answer: (b) potassium

Q2: Which metal is liquid at room temperature?

(a) bromine

(b) calcium

(c) mercury

(d) sodium

Answer: (c) mercury

Q3: Name a metal from the following that is not corroded by air, water or acid,

(a) zinc

(b) aluminium

(c) copper

(d) gold

Answer: (d) gold

QUESTION PAPER 2

Materials: Metals and Non-Metals Class 8 Extra Questions Very Short Answer Questions

Question 1.
Name some common metals.
Answer:
Copper, aluminium, iron, silver, gold, etc.

Question 2.
Name some common non-metals.
Answer:
Hydrogen, oxygen, carbon, sulphur, phosphorus, etc.

Question 3.
Give examples of metalloids.
Answer:
Antimony, arsenic, silicon, boron, etc.

Question 4.
Name the property due to which metals shine.
Answer:
Lustre

Question 5.
Name two metals which are soft enough to be cut.
Answer:
Potassium and sodium

Question 6.
Name the property due to which metals can be beaten into thin sheets.
Answer:
Malleability

Question 7.
Which non-metal does conduct heat and electricity?
Answer:
Carbon

Question 8.
Name the property due to which metals can be drawn into wires.
Answer:
Ductility

Question 9.
Name the metal and non-metal which occur in liquid state.
Answer:
Mercury (metal), bromine (non-metal).

Question 10.
Due to which property a bell rings?
Answer:
Sonority

Question 11.
Generally non-metals are non-lustrous. Name one non-metal which is lustrous.
Answer:
Iodine

Question 12.
State the property of non-metals due to which phosphorus is kept in water.
Answer:
Non-metals do not react with water.

Question 13.
Why some metals displace other metals from their solution?
Answer:
Because of being more reactive than the metals which they displace.

Question 14.
Which metal is used for wrapping food items?
Answer:
Aluminium

Question 15.
Which metal is more reactive: Iron or zinc?
Answer:
Zinc

Question 16.
Which metal is less reactive: Copper or zinc?
Answer:
Copper

Question 17.
Name one metal which does not react with dilute hydrochloric acid.
Answer:
Copper

Question 18.
Whose oxides are basic in nature: Metal or non-metal?
Answer:
Metal

Question 19.
Whose oxides are acidic: Metal or non-metal?
Answer:
Non-metal

Question 20.
Name two metals which do not react with oxygen even at high temperature.
Answer:
Gold and silver

Question 21.
Classify the following into metals and non-metals:
Copper, iron, graphite, sulphur, aluminium, oxygen
Answer:
Metals: Copper, iron, aluminium
Non-metals: Graphite, sulphur, oxygen

Question 22.
Name two physical properties of metals.
Answer:
Malleability and sonority

Question 23.
What happens when metals react with oxygen?
Answer:
Metal oxides are formed.

Question 24.
What happens when magnesium is burnt in air?
Answer:
Magnesium burns with a white dazzling flame and a white powdery magnesium oxide is formed.

Question 25.
What happens when metals react with water?
Answer:
Metals produce their hydroxides or oxides and hydrogen.

Materials: Metals and Non-Metals Class 8 Extra Questions Short Answer Questions

Question 1.
What is a metal?
Answer:
Substances having characteristic properties like malleability, ductility, sonority, conductivity, lustre, – and solidness are called metals. For example, aluminium, copper, zinc, iron, etc.

Material properties comparison

Question 2.
What are non-metals?
Answer:
Substances which are soft and dull, i.e., non-lustrous, non-sonorous, non-ductile, non-malleable and poor conductor of heat and electricity are called non-metals. For example, oxygen, hydrogen, sulphur, etc.

Question 3.
Mention the physical properties of metals.
Answer:
Physical properties of metals are:

- Malleable
- Lustre
- Sonorous
- Ductile
- Solid
- Good conductor of heat and electricity

Question 4.
What are the physical properties of non-metals?
Answer:
The physical properties of non-metals are:

- Non-malleable
- Non-sonorous
- Non-lustrous, i.e., dull in appearance
- Non-ductile
- Poor conductor of heat and electricity

Question 5.
Explain the term ‘malleability’ with suitable examples.
Answer:
Malleability is the property of metals due to which they can be beaten into thin sheets. For example, if we beat or hammer any metal like aluminium, zinc, iron, copper, etc., it become longer and larger but does not break. Thin sheets can be obtained by this process.

Question 6.
What is ductility? Explain with examples.
Answer:
Ductility is one of the properties of metals due to which they can be drawn into wires. For example, aluminium and copper are drawn into wires and used for electrical and different purposes.

Question 7.
Why aluminium is used for wrapping of food items?
Answer:
Aluminium is a metal and hence possesses malleability property. It can be beaten into thin sheets and can be folded into any shape. It is cheaper than other malleable metals and does not react with food items. That is why it is used as wrapping materials for food items.

Question 8.
Why metals are used in ringing bells?
Answer:
Metals have sonority. Due to this property, they can produce ringing sounds. That is why metals are used in ringing bells.

Question 9.
What are the differences between metals and non-metals? Explain on the basis of their physical properties.
Answer:

- Metals are malleable and give thin sheets after hammering whereas non-metals are brittle and give no sheets.
- Metals are ductile and can be drawn into wires whereas non-metals are non-ductile and can’t be drawn into wires.
- Metals are sonorous and used in ringing bells whereas non-metals are non-sonorous and cannot be used in ringing bells.

- Metals are good conductors of heat and electricity while non-metals are poor conductors.

Question 10.
What happen when a copper vessel is exposed to moist air for long? Also write the equation.
Answer:
When a copper vessel is exposed to moist air for long, it acquires a dull green coating. This green material is a mixture of copper hydroxide [$Cu(OH)_2$] and copper carbonate ($CuC0_3$). The reaction is as follows:

$$2Cu + \underbrace{H_2O + CO_2}_{\text{moist air}} + O_2 \rightarrow Cu(OH)_2 + CuCO_3$$

Material properties comparison

Question 11.
What happens when a magnesium ribbon is heated in presence of air?
Answer:
When a magnesium ribbon is heated in presence of air, it burns with a white dazzling flame and a white powdery magnesium oxide is formed.

$$\underset{\text{Magnesium}}{2Mg} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Magnesium oxide}}{2MgO}$$

Question 12.
How do metals and non-metals react with water?
Answer:
Metals produce their hydroxides or oxides and hydrogen when they react with water. Sodium and potassium react with cold water along with the production of a large amount of heat. Magnesium react with boiling water and iron with steam. Gold, silver and platinum do not react with water. Non-metals do not react with water.

Question 13.
With the help of equations, explain the reaction of non-metals with oxygen.
Answer:
Non-metals react with oxygen to form acidic oxides. But most of the non-metals reacts with oxygen on ignition. The equations follow as:

$$\underset{\text{Carbon}}{C} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Carbon dioxide}}{CO_2}$$

$$\underset{\text{Sulphur}}{S} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Sulphur dioxide}}{SO_2}$$

Question 14.
How do metals and non-metals react with acids?
Answer:
Metals react with acids to form respective salts along with evolution of hydrogen gas that burns with a pop sound. The equation are as follows:

$$\underset{\text{Sodium}}{2Na} + \underset{\text{Hydrochloric acid}}{2HCl} \rightarrow \underset{\text{Sodium chloride}}{2NaCl} + \underset{\text{Hydrogen}}{H_2}\uparrow$$

$$\underset{\text{Zinc}}{Zn} + \underset{\text{Sulphuric acid}}{H_2SO_4} \rightarrow \underset{\text{Zinc sulphate}}{ZnSO_4} + \underset{\text{Hydrogen}}{H_2}\uparrow$$

There are some metals like copper, silver, gold and platinum that do not liberate hydrogen with acids. Generally, non-metals do not react with acids.

Question 15.
How do metals and non-metals react with bases?
Answer:
Most of the metals do not react with bases. However, some metals like aluminium, lead and zinc react with strong bases like sodium hydroxide (NaOH) to make complex salts and hydrogen.
Generally, non-metals do not react with bases. Sometimes some complex reactions take place between non-metals and bases.

Question 16.
What is a displacement reaction? Give one example.
Answer:
A chemical reaction in which a more reactive metal displaces a less reactive metal is called displacement , reaction. For example, when zinc (Zn) reacts with copper sulphate ($CuS0_4$), zinc replaces copper being it more reactive than copper. The equation is
$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

Materials: Metals and Non-Metals Class 8 Extra Questions Long Answer Questions

Question 1.
Distinguish between metals and non-metals on the basis of their physical properties.
or
Compare the physical properties of metals and non-metals.
Answer:
Difference between metals and non-metals on the basis of their physical properties.

Physical Properties	Metals	Non-metals
1. Malleability	Metals are malleable, *i.e.*, they can be beaten into thin sheets. Exception: Mercury	Non-metals are non- malleable. They are broken into pieces when hammered. Hence they are also called brittle.
2. Sonority	Metals are sonorous, *i.e.*, they produce ringing sound when struck.	Non-metals are non-sonorous.
3. Ductility	Metals are ductile, *i.e.*, they can be drawn into wires. Exception: Mercury	Non-metals are non-ductile.
4. Lustre	Metals are lustrous, *i.e.*, they are shiny.	Non-metals are non-lustrous, *i.e.*, they are dull in appearance. Exception: Graphite and iodine.
5. Hardness or solidness	Metals are hard except sodium and potassium.	Non-metals are soft except diamond.
6. Conductivity	Metals are good conductor of heat and electricity.	Non-metals are poor conductor of heat and electricity. Exception: Graphite is a non-conductor of heat and electricity.
7. Density	Metals are of high density except lithium.	Non-metals are of low density.
8. Melting and boiling points.	Metals have high melting and boiling points.	Non-metals have low melting and boiling points except graphite.

Material properties comparison

Question 2.

Distinguish between metals and non-metals on the basis of their chemical properties.

or

Compare between metals and non-metals on the basis of their chemical properties.

Answer:

Difference between metals and non-metals on the basis of their chemical properties.

Chemical Properties	Metals	Non-metals
1. Reaction with oxygen	Metals react with oxygen to form basic oxides which form bases when dissolve in water.	Non-metals react with oxygen to form acidic oxides which form acids when dissolve in water.
2. Reaction with water	Metals react with water to form their oxides or hydroxides.	Non-metals do not react with water.
3. Reaction with acids	Metals react with acids to produce respective salts along with evolution of hydrogen gas. Some metals like Cu, Ag, Au, etc., do not liberate hydrogen gas.	Non-metals do not react with acids except sulphur which react with hot, concentrated acid.
4. Reaction with bases	Most of the metals do not react with bases. However, some metals like Al, Pb, Zn react with strong bases like NaOH to form complex salts and hydrogen gas.	Generally, non-metals do not react with bases. Sometimes, some complex reactions take place between non-metals and bases.

Question 3.
Explain chemical properties of metals with examples.
Answer:
(i) Reaction with oxygen or air: Metals react with oxygen to form basic oxides.
Some metals like potassium and sodium react vigorously with oxygen. For example,

$$\underset{\text{Sodium}}{4Na} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Sodium oxide}}{2Na_2O}$$

$$\underset{\text{Potassium}}{4K} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Potassium oxide}}{2K_2O}$$

Some noble metals like gold, silver and platinum do not react with oxygen. Iron (Fe) and copper (Cu) get rusted when react in presence of oxygen and water (moist air).

(ii) Reaction with water: Metals react with water to form their oxides or hydroxides. Gold, silver and platinum do not react with water. Some metals like sodium, potassium react vigorously with water. For example,

$$\underset{\text{Sodium}}{2Na} + \underset{\text{Water (cold)}}{2H_2O} \rightarrow \underset{\text{Sodium hydroxide}}{2Na(OH)} + \underset{\text{Hydrogen}}{H_2\uparrow}$$

$$\underset{\text{Magnesium}}{Mg} + \underset{\text{Water (boiling)}}{H_2O} \rightarrow \underset{\text{Magnesium oxide}}{MgO} + \underset{\text{Hydrogen}}{H_2\uparrow}$$

(iii) Reaction with acids: Metals react with acid to form their salts followed by evolution of hydrogen gas. For example,

$$\underset{\text{Magnesium}}{Mg} + \underset{\text{Hydrochloric acid}}{2HCl} \rightarrow \underset{\text{Magnesium chloride}}{MgCl_2} + \underset{\text{Hydrogen}}{H_2\uparrow}$$

$$\underset{\text{Aluminium}}{2Al} + \underset{\text{Sulphuric acid}}{3H_2SO_4} \rightarrow \underset{\text{Aluminium sulphate}}{Al_2(SO_4)_3} + \underset{\text{Hydrogen}}{3H_2\uparrow}$$

Some metals like gold, copper, silver, etc., do not liberate hydrogen gas with acids.

(iv) Reaction with bases: Most of the metals do not react with bases. However some metals like alu-minium, zinc and lead react with strong bases like sodium hydroxide to make complex salts and produce hydrogen.
(v) Displacement reactions: More reactive metals displace less reactive metals. For example,

$$\underset{\text{Zinc}}{Zn} + \underset{\text{Copper sulphate}}{CuSO_4} \rightarrow \underset{\text{Zinc sulphate}}{ZnSO_4} + \underset{\text{Copper}}{Cu}$$

$$\underset{\text{Magnesium}}{Mg} + \underset{\text{Copper sulphate}}{CuSO_4} \rightarrow \underset{\text{Magnesium sulphate}}{MgSO_4} + \underset{\text{Copper}}{Cu}$$

In the above reactions, zinc (Zn) and magnesium (Mg) are more reactive than copper (Cu), hence they replace copper from its solution.

Question 4.
Explain with suitable examples the chemical properties of non-metals.
Answer:
(i) Reaction with oxygen: Non-metals react with oxygen to form acidic oxides. But most of them do this on ignition. For example,

$$\underset{\text{Hydrogen}}{2H_2} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Water}}{2H_2O}$$

$$\underset{\text{Sulphur}}{S} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Sulphur dioxide}}{SO_2}$$

(ii)They form negative ions and are good oxidising agents.
(iii) Reaction with water: Non-metals do not react with water.
(iv) Reaction with acids and bases: Generally, non-metals do not react with acids and bases. How¬ever, sometimes some complex reactions take place between non-metals and bases.

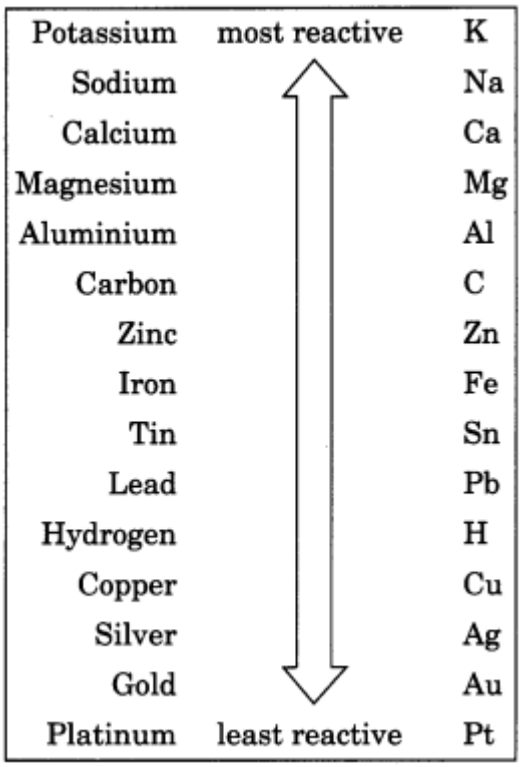
Question 5.
What are main uses of metals?
or
How are metals useful to us?
Answer:
Metals are very useful to us in many ways. For example,

- Due to their thermal and electrical conductivity, metals are use to make utensils, cooking vessels, wires and appliances. For example, copper and aluminium are mainly used for these purposes.
- Metals like iron and steel are used in various tools, machinery, pipes, rods, sheets, doors, windows, construction works like bridges, roads, buildings, etc.,
- Aluminium is used as packaging and wrapping materials. It is also used in aircrafts and automobiles, etc.
- Metals like gold, silver and platinum are used to make jewellery and other decorating items.
- Zinc is used in galvanisation and dry cell and chromium in electroplating.
- Lead is used in making electrodes and batteries.
- Material properties comparison

Question 6.
What are the main uses of non-metals?
or
How are non-metals useful to us?
Answer:
Like metals, non-metals also play an important role in our lives. They help us in many ways. For example,

- We breathe oxygen which is the basis of life of all living things including human beings. Without it, no living beings can exist alive on this earth.
- CO_2 which is a non-metal oxide is essential for plants to carry out photosynthesis.
- Non-metals like nitrogen and phosphorus are used in fertilisers for better yield of plant. Phosphorus is used in manufacturing of matchsticks and fireworks.
- Non-metal like iodine is used in the purple coloured solution applied on wounds. Sulphur is also used in preparing skin medicines and making ointment due to its fungicidal properties.
- Non-metal like chlorine is used in water purification process. Due to its bleaching properties it is used to make bleaching powder.
- Carbon, a non-metal, is used in most of the fuels.

Question 7.
What is reactivity series? Suggest an activity to arrange sodium, magnesium and copper in the order of their decreasing reactivity.
Answer:



Reactivity series is an arrangement of metals in decreasing order of their reactivity from highest to lowest. The metals occupying the higher positions in the activity series are more reactive in displacing the other metals lying below it from the solutions of their salts.

The activity series is a useful guide for predicting the products of metal displacement reactions. For example, placing a strip of zinc metal in a copper (II) sulphate solution will produce metallic copper and zinc sulphate, since zinc is above copper on the series.

A strip of copper placed into a zinc sulphate solution will not produce an appreciable reaction, because copper is below zinc on the series and can't displace zinc ions from solution.
Activity to arrange sodium, magnesium and copper in the order of their decreasing reactivity:

- Take a pinch of sodium with a forceps and place in a beaker containing water. You will notice that sodium reacts vigorously.
  $2Na(s) + 2H_2O(aq) \rightarrow 2NaOH(aq) + H_2(g)$
- Take a small piece of magnesium ribbon and add warm water to it. Magnesium reacts with warm water to form magnesium oxide and hydrogen gas. Magnesium reacts very slowly with cold water.
  $Mg(s) + 2H_2O(aq) \rightarrow Mg(OH)_2(aq) + H_2(g)$

- Take small pieces of copper turnings and add warm water to it. It doesn't react with warm water also.
  $Cu(s) + 2H_2O(aq) \rightarrow$ No reaction
  Hence, increasing order of reactivity is Na > Mg > Cu.

Materials: Metals and Non-Metals Class 8 Extra Questions Higher Order Thinking Skills

Question 1.
Why does calcium float in water?
Answer:
The hydrogen gas formed on adding calcium to water sticks to the surface of calcium solid and make it float in water.

Material properties comparison

Question 2.
Zinc sulphate forms a colourless solution in water. Will you observe any colour on adding copper turn-ing in it?
Answer:
No, because copper is less reactive than zinc and will not be able to displace zinc from its salt solution.

Question 3.
A doctor prescribed a tablet to a patient suffering from iron deficiency. The tablet does not look like iron. Explain.
Answer:
The tablet is not made of iron metal, instead it contains a salt of iron.

Question 4.
Ram stored copper sulphate solution in a container made of iron. He observed certain changes after few hours. Can you tell what changes did he observed?
Answer:
Blue colour solution of copper sulphate has changed to green colour of ferrous sulphate. The iron container was found to be corroded from many places. A red powdery deposit of copper sulphate was found on the iron container.

Question 5.
Imagine that gold is reactive like copper. Will it be still wanted? Why or why not?
Answer:
If gold becomes reactive like copper then its use in ornaments will decline. This is

because due to its increase reactivity it will loose its shine frequently which in turn will reduce its demand.

Materials: Metals and Non-Metals Class 8 Extra Questions Value-Based Questions

Question 1.
Gold is a very precious metal. Pure gold is very soft and is thus not suitable for making jewellery. It is alloyed with either silver or copper to make it hard. But some jewellers mix a large quantity of copper and silver in gold to earn more profit.
(a) What precautions should you take while purchasing gold jewellery?
(b) What standard you must see on gold ornaments?
(c) What value of shopkeeper's are shown here?
Answer:
(a) We must see the carat of gold jewellery, current price and BIS hallmark on it.
(b) BIS hallmark.
(c) Some shopkeeper's are greedy, mean, cheater and money minder.

Question 2.
Mercury is largely used in thermometers to measure the temperature. It is a very dangerous metal as its density is very high. If it get into the food chain, it leads to mercury poisoning.
(a) What two precautions you must take while handling equipments containing mercury?
(b) Why mercury is used in thermometers?
(c) Can you suggest other alternatives to mercury thermometers?
Answer:
(a)

- We must handle the equipments carefully and firmly.
- If there is a mercury spill, we must leave the area immediately and inform our parents or teachers.

(b) Mercury is a good conductor of heat. Hence, the slightest change in temperature is potable when it is used in a thermometer.
(c) Digital thermometer and spirit thermometer.

Activities and Projects
Question 1.
Prepare Index Cards for any four metals and four non-metals. The card should have

information like name of metal/non-metal; its physical properties, chemical properties and its uses.
Answer:
An index card is used for recording and storing small sizes of discrete data. It consists of heavy paper cut to a standard size.
Here, one example of non-metal is done for you. The rests you should try to do yourself.

Name of Non-metal	Physical Properties	Chemical Properties	Uses
Oxygen	**Colour:** Colourless **Odour:** No odour **Phase:** Gas **Taste:** No taste **Conductivity:** Poor conductor of heat and electricity **Solubility:** Slightly soluble in water and alcohol **Density:** Denser than air	**Chemical formula:** O_2 **Combustion:** Helps in combustion but does not burn itself. **Compounds:** Many compounds such as H_2O, Fe_2O_3, CO_2, Na_2O, etc. **Oxidation:** Goes oxidation reaction by combining with other substances to make oxides. Oxides of some metals form peroxides with combination of oxygen.	• Needed for the living beings to breathe. • Essential for all the burning processes even inside our body for processes like respiration.

Question 2.
Visit a blacksmith and observe how metals are moulded.
Answer:
Do it yourself.

Question 3.
Suggest an experiment to compare the conductivity of electricity by iron, copper, alumini¬um and zinc. Perform the experiment and prepare a short report on the results.
Answer:
You can do this yourself with the help of electric tester. The process is explained here for your help.
Take an electric tester and test the conductivity of the given metals separately with the wires of same length and thickness. Observe the brightness of the lighting bulb. Now compare the conductivity of all metals according to their brightness as you observed. Finally prepare a short report based on your findings.

Question 4.
Find out the locations of the deposits of iron, aluminium and zinc in India. Mark these in an outline map of India. In which form are the deposits found? Discuss in the class.
Answer:
The locations of the deposits of these metals may be shown on the map of India. You are advised to practice it at home. Also have a discussion on this in the class.

Question 5.
Discuss with your parents/neighbours/goldsmiths why gold is preferred for making jewellery.
Answer:
Gold is a special metal in terms of ductility and malleability. It can be drawn into wires thinner that a hair or beaten into thin sheets. That is why it is prepared for making jewellery.

Question 6.
Visit the following websites and enjoy the quiz on metals and non-metals:

- chemistry.about.com/library/weekly/bl050303a.htm
- chemistry.about.com/od/testsquizzes/Chemistry_Tests_Quizzes.htm
- www.gcsescience.com/q/qusemet.html
- www.corrosionsource.com/handbook/periodic/metals.htm

Answer:
You, can do it yourself for more knowledge about metals and non-metals.

I. Multiple Choice Questions (MCQs)
Choose the correct option.
Question 1.
Metals are
(a) shiny
(b) hard
(c) sonorous
(d) all of these

Question 2.
Non-metals are
(a) non-ductile
(b) non-sonorous
(c) non-malleable
(d) all of these

Question 3.
Which of the following is a non-metal?
(a) Aluminium
(b) Oxygen
(c) Iron
(d) Siolver

Question 4.
Metalloids possess the properties of
(a) metals
(b) non-metals
(c) both metals and non-metals
(d) none of these

Question 5.
The most reactive metal is
(a) copper
(b) zinc
(c) Potassium
(d) gold

Question 6.
Non-metals are
(a) generally gases
(b) generally liquids
(c) generally solids
(d) generally solid and gasses

Question 7.
Which of the following metal is stored in kerosene?
(a) Sodium
(b) Magnesium
(c) Phosphorus
(d) Zinc

Question 8.
Metal oxides are
(a) neutral
(b) basic
(c) acidic
(d) all of these

Question 9.
The non-metal which is liquid at room temperature is
(a) bromine
(b) chlorine
(c) iodine
(d) carbon

Question 10.
Which substance is used for making pencil lead?
(a) Sulphur
(b) Silicon
(c) Graphite
(d) Aluminium

Question 11.
Which non-metal is used in making glass?
(a) Graphite
(b) Sulphur
(c) Silica
(d) None of these

Question 12.
Which metal is used in wrapping materials?
(a) Aluminium
(b) Zinc
(c) Copper
(d) None of these

Material properties comparison

Question 13.
The metal found in liquid state is
(a) mercury
(b) silver
(c) calcium
(d) sodium

Question 14.
The most ductile metal is
(a) silver
(b) gold
(c) copper
(d) aluminium

Question 15.
Non-ipetals
(a) react with water
(b) do not react with water

(c) both (a) and (b)
(d) none of these

Question 16.
Which of the following metals are soft enough to be even cut with a knife?
(a) Sodium
(b) Potassium
(c) Lithium
(d) All of these

Question 17.
Which is the hardest substance?
(a) Gold
(b) Diamond
(c) Aluminium
(d) None of these

Question 18.
Metals react with acids to produce respective salts with evolution of
(a) hydrogen gas
(b) oxygen gas
(c) CO_2 gas
(d) none of these

Question 19.
In displacement reactions
(a) a more reactive metal displaces a less reactive metal.
(b) a less reactive metal displaces a more reactive metal.
(c) both (a) and (b)
(d) none of these

Question 20.
Which of the following non-metals are used in fertilisers?
(a) Nitrogen
(b) Phosphorus
(c) Both (a) and
(d) None of these
Answer:
1. (d)
2. (d)
3. (b)

4. (c)
5. (c)
6. (d)
7. (a)
8. (b)
9. (a)
10. (c)
11. (c)
12. (a)
13. (a)
14. (b)
15. (b)
16. (d)
17. (b)
18. (a)
19. (a)
20. (c)

II. Fill in the Blanks

Fill in the blanks with suitable word/s.

1. Metals are _____ of heat and _____.
2. Iodine is a _____ having lustre.
3. _____ and _____ are kept in kerosene to avoid explosion.
4. Non-metal oxides are _____ in nature.
5. _____ is more reactive than copper.
6. Sulphur forms _____ oxides.
7. Magnesium forms _____ oxides.
8. _____ is less reactive than iron.
9. All metals are hard except _____ and _____.
10. Metals have generally _____ melting and boiling points.
11. _____ are used in medicines as antiseptic.
12. The only liquid metal is _____.
13. _____ is non-metal used in breathing by all living beings.
14. The metal which produces hydrogen gas on reaction with dilute hydrochloric acid as well as sodium hydroxide solution is _____.
15. _____ reacts with cold water vigorously.

Answer:

1. good conductors, electricity
2. non-metal
3. Sodium, potassium
4. acidic
5. Zinc

6. acidic
7. basic
8. Copper
9. sodium, potassium
10. high
11. Non-metals
12. mercury
13. Oxygen
14. aluminium
15. Sodium

III. Match the following

Match the items given in column I suitably with those given in column II.

Column I	Column II
1. Malleable	(a) Can be transformed into wire
2. Ductile	(b) For making crackers
3. Oxygen	(c) Give sheets on hammering
4. Copper	(d) For disinfecting water
5. Sulphur	(e) All living beings inhale during breathing
6. Diamond	(f) For making electric wires
7. Sonority	(g) For making rails
8. Iron	(h) Hardest non-metal
9. Chlorine	(i) Ringing of bells
10. Platinum	(j) Used in making ornaments

Answer:
1. (c)
2. (a)
3. (e)
4. (f)
5. (b)
6. (h)
7. (i)
8. (g)
9. (d)
10. (j)

IV. True or False

State whether the given statements are true or false.

1. Metals are non-sonorous.

2. Metals react with water.
3. Non-metals cannot be converted into wires.
4. The only liquid metal is bromine.
5. Sodium and potassium do not react vigorously with water and oxygen.
6. Basic solution turns red litmus into blue.
7. Graphite is a good conductor of electricity.
8. Generally, metallic oxides are basic and non-metallic oxides are acidic in nature.
9. Chlorine is not a non-metal.
10. Phosphorus is kept in water.
11. All metals exist in solid form at room temperature.
12. Rust formed on iron object is acidic in nature.
13. Aluminium is more reactive than copper.
14. Non-metals react with water to form a gas which burns with a ‘pop’ sound.
15. All the gases are non-metals.

Answer:

1. False
2. True
3. True
4. False
5. False
6. True
7. True
8. True
9. False
10. True
11. False
12. False
13. True
14. False
15. True