

4. Materials: Metals and Non-Metals Class 8 Science

Question 1.

Which of the following can be beaten into thin sheets?

- (a) Zinc
- (b) Phosphorus
- (c) Sulphur
- (d) Oxygen

Answer:

- (a) Zinc

Question 2.

Which of the following statements is correct?

- (a) All metals are ductile.
- (b) All non-metals are ductile.
- (c) Generally, metals are ductile.
- (d) Some non-metals are ductile.

Answer:

- (c) Generally, metals are ductile

Question 3.

Fill in the blanks.

- (a) Phosphorus is a very _____ non-metal.
- (b) Metals are _____ conductors of heat and _____
- (c) Iron is _____ reactive than copper.
- (d) Metals react with acids to produce _____ gas.

Answer:

- (a) reactive
- (b) good, electricity
- (c) more
- (d) hydrogen

Question 4.

Mark 'T' if the statement is true and 'F' if it is false.

- (a) Generally, non-metals react with acids.
- (b) Sodium is a very reactive metal.
- (c) Copper displaces zinc from zinc sulphate solution.
- (d) Coal can be drawn into wires.

Answer:

- (a) False
- (b) True
- (c) False
- (d) False

Question 5.

Some properties are listed in the following Table. Distinguish between metals and non-metals on the basis of these properties.

Properties	Metals	Non-metals
1. Appearance		
2. Hardness		
3. Malleability		
4. Ductility		
5. Heat Conduction		
6. Conduction of Electricity		

Answer:

Properties	Metals	Non-metals
1. Appearance	have metallic lustre	dull
2. Hardness	hard	soft
3. Malleability	malleable	non-malleable
4. Ductility	ductile	non-ductile
5. Heat Conduction	good conductors	bad conductors
6. Conduction of Electricity	good conductors	bad conductors/insulators

Question 6.

Give reasons for the following.

- Aluminium foils are used to wrap food items.
- Immersion rods for heating liquids are made up of metallic substances.
- Copper cannot displace zinc from its salt solution.
- Sodium and potassium are stored in kerosene.

Answer:

- Aluminium is highly malleable and it can be easily beaten in sheets to make its foil for wrapping purposes. It is also soft and does not react with food items. That is why aluminium foils are used . to wrap food items.
- Immersion rods made up of metallic substances because metals are good conductors of heat and electricity. They get hot very soon on the passage of electric current and warm the water.
- Copper is less reactive than zinc. So it cannot displace zinc from its solution.
- Sodium and potassium are highly reactive, so they are stored in kerosene.

Question 7.

Can you store the lemon pickle in an aluminium utensil? Explain.

Answer:

No, we cannot store lemon pickle in an aluminium utensil because aluminium is a metal and metals readily react with acids to produce hydrogen. When aluminium comes in contact with lemon, which is acidic, would react to give hydrogen and the pickles will be spoiled.

Question 8.

Match the substances given in column A with their uses given in column B.

A	B
Gold	Thermometers
Iron	Electric wire
Aluminium	Wrapping food
Carbon	Jewellery
Copper	Machinery
Mercury	Fuel

Answer:

(i) (d)

(ii) (e)

(iii) (c)

(iv) (f)

(v) (b)

(vi) (a)

Question 9.

What happens when

(a) Dilute sulphuric acid is poured on a copper plate?

(b) Iron nails are placed in a copper sulphate solution?

Write word equations of the reactions involved.

Answer:

(a) No reaction will take place because copper is very less reactive.

(b) Iron being more reactive than copper will replace copper from its solution and brown coating of copper is deposited on the iron nails. Also, the blue colour turns green.

Iron + Copper sulphate (solution) → Iron sulphate (solution) + Copper

Question 10.

Saloni took a piece of burning charcoal and collected the gas evolved in a test tube.

(a) How will she find the nature of the gas?

(b) Write down the word equations of all the reactions taking place in this process.

(a) She can find the nature of the gas by using a wet litmus paper. After bringing the litmus paper in contact with the gas, if it turns the blue litmus paper into red, it is acidic. Similarly, if it turn the red litmus into blue, it is basic.

(b) (i) Carbon + Oxygen → Carbon dioxide

(ii) Carbon dioxide + Lime water → Milky

Question 11.

One day Reeta went to a jeweller's shop with her mother. Her mother gave an

old gold jewellery to the goldsmith to polish. Next day when they brought the jewellery back, they found that there was a slight loss in its weight. Can you suggest a reason for the loss in weight?

Answer:

The gold jewellery is dipped into an acidic solution called aqua regia (a mixture of hydrochloric acid and nitric acid) for polishing. On dipping the gold jewellery in the acid solution, the outer layer of gold dissolves and the inner shiny layer appears. This causes a slight loss in its weight.

Chapter 4 - 1 Mark Questions and Answers

Question 1.

Non-metals cannot be drawn into wires. Why ? [DAV2008]

Answer:

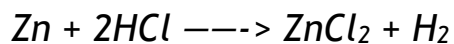
Non-metals are not ductile, therefore they cannot be drawn into wires.

Question 2.

Complete the following equation :



Answer:



Question 3.

Which of the following can be beaten into thin sheets ? [NCERT]

- Zinc
- Phosphorus
- Sulphur
- Oxygen.

Answer:

Zinc.

Question 4.

The number of metals is much than non-metals.

Answer:

More.

Question 5.

..... are the good conductors of heat and electricity.

Answer:

Metals.

Question 6.

Examples of metals are, and

Answer:

Iron, sodium and nickel.

Question 7.

Examples of non-metals are , and

Answer:

Sulphur, chlorine and oxygen.

Question 8.

Explain the term 'metallurgy'.

Answer:

Metallurgy is the science of extracting metals from their ores and purifying them for various uses.

Question 9.

State general steps involved in metallurgy of a metal.

Answer:

The general steps of metallurgy are :

- Concentration of ore.
- Reduction of the metal compound.
- Refining of metal.

Question 10.

Metals are (softer/harder) than non-metals.

Answer:

Harder.

Question 11.

Most non-metals are (bad/good) conductors of heat.

Answer:

Bad.

Question 12.

The property that allows the metals to be hammered into thin sheets is called (ductility/ malleability).

Answer:

Malleability.

Question 13.

Melting point of most non-metals is (higher/lower) than metals.

Answer:

Lower.

Question 14.

(Metals/non-metals) display lustre.

Answer:

Metals.

Question 15.

Arrange the following metals in the order of their decreasing chemical activity :

magnesium, potassium, iron, gold.

Answer:

Potassium, magnesium, iron, gold.

Question 16.

Can copper displace iron from iron sulphate solution ? Give reasons.

Answer:

Copper cannot displace iron from iron sulphate because copper is less reactive than iron.

Question 17.

(Platinum/iron) is the member of the family of noble metals.

Answer:

Platinum.

Question 18.

Pure gold is (24/ 100) carats.

Answer:

24.

Question 19.

International standards of weights are made of (gold-silver/platinum-iridium) alloy.

Answer:

Platinum-iridium.

Question 20.

Gold dissolves in (aqua regia/aqueous solution of silver nitrate).

Answer:

Aqua regia.

Question 21.

Silver tarnishes due to (nitrogen oxides/hydrogen sulphide) in the air.

Answer:

Hydrogen sulphide.

Question 22.

Why is aluminium used in making aeroplanes ?

Answer:

Aluminium is used in making aeroplanes, as it is light and has high resistance to corrosion when exposed to air which aircrafts demand the most.

Question 23.

What type of oxides are formed by metals ?

Answer:

Metals form basic oxides.

Question 24.

What type of oxides are formed by non-metals ?

Answer:

Non-metals form acidic or neutral oxides.

Question 25.

How does phosphorus occur in nature ?

Answer:

Phosphorus occurs in nature in the combined state as it has strong affinity for oxygen.

Question 26.

Give the different forms of silica in nature.

Answer:

Silica occurs in nature as ordinary sand, flint, quartz and opal.

Question 27.

Which metal foil is used in packing of some medicine tablets ?

Answer:

Aluminium.

Question 28.

Name the soft metal which can be cut with a knife.

Answer:

Sodium or potassium.

Question 29.

Name the non-metal used in vulcanization.

Answer:

Sulphur.

Question 30.

Name one metal which is not malleable.

Answer:

Zinc or arsenic.

Question 31.

Name one non-metal which has lustre.

Answer:

Graphite or Iodine.

Question 32.

What would happen to iron railings if they are not painted ?

Answer:

They will get rusted.

Question 33.

Name the element commonly used for converting edible vegetable oils into

vanaspati ghee.

Answer:

Hydrogen.

Question 34.

Name the element used for making containers of dry cells.

Answer:

Zinc.

Question 35.

Which metal is used for making radiators of cars ?

Answer:

Copper.

Question 36.

Name the metal whose salt is used for making photographic films.

Answer:

Silver.

NCERT Solutions for Class 8 Science Chapter 4 - 2 Mark Questions and Answers

Question 1.

White phosphorous has to be kept in water. Why ? [NCT2007]

Answer:

Phosphorus is to be kept in water to prevent its contact with air because it is highly reactive.

Question 2.

Can you store lemon pickle in an aluminium utensils ? Explain. [NCERT]

Answer:

We cannot store acidic food stuffs in aluminium utensils because aluminium reacts with acids. The food gets spoiled.

Question 3.

One day Reeta went to a jeweller's shop with her mother. Her mother gave an old gold jewellery to the goldsmith to polish. Next day when they brought the jewellery back, they found that there was a slight loss in its weight. Can you suggest a reason for the loss in weight ? [NCERT]

Answer:

The goldsmith must have used acid to clean the gold jewellery and some gold must have dissolved in it. Therefore, there was loss in weight of the jewellery.

Question 4.

Write short notes on

1. Metallurgical processes
2. Uses of common metals and non-metals
3. Noble metals

Answer:

1. Metallurgical process can be divided into following steps :
 - Concentration of the ore
 - Reduction of metal compound to get free metal
 - Refining of metal.
2. Uses of common metals and non-metals :

Uses of metals - for making machinery, automobiles, industrial gadgets, building, bridges, cooking utensils, electrical gadgets, jewellery, sheets.

Uses of non-metals - oxygen is used by plants and animals for their survival, nitrogen is used by plants for their growth, chlorine is used in water purification to kill germs, sulphur is used for making sulphuric acid, tincture iodine has antiseptic properties.
3. Noble metals - Gold, silver and platinum are noble metals. They occur free in nature . and maintain their lustre for a long time. Platinum, gold and silver are used for making jewellery as they do not tarnish.

Question 5.

Purity of gold is 15 carat. What is the percentage of gold in the ornaments ?

Answer:

24 carat purity of gold = 100

∴ 1 carat purity of gold = $100/24$

15 carat purity of gold = $(100 \times 15)/24 = 62.5 \%$

Question 6.

Give two uses of sulphur in chemical industry.

Answer:

- It is used in the manufacture of sulphuric acid.
- It is used in the manufacture of carbon disulphide, which is used as an industrial solvent.

Question 7.

How is sulphur useful in agriculture ? How is sulphur useful in medicine ?

Answer:

Sulphur powder is an excellent insecticide and fungicide. It is used in spraying fruit trees.

- Sulphur is the main constituent of skin ointments.
- Metallic sulphides of sulphur are used in the preparation of Ayurvedic medicines.

Question 8.

Give two important uses of silver.

Answer:

- It is used for making coins.

- Silver salts (silver bromide and silver iodide) are used for making photographic films.

Question 9.

Give two uses of gold.

Answer:

- Gold is used for making ornaments.
- Gold foils are used in the preparation of Ayurvedic medicines.

Question 10.

Give two uses of platinum.

Answer:

- It is used as a catalyst in the manufacture of sulphuric and nitric acid.
- Platinum catalytic converters use platinum as catalytic agent.

Question 11.

Which of the following will form acidic oxide and why :

P, K, Na, Ca?

Answer:

P (Phosphorus) will form acidic oxide because it is a non-metal.

Question 12.

You are given two materials X and Y. On hammering X is flattened, but Y breaks. Which one is a metal ?

Answer:

X is a metal because it flattens, i.e., it is malleable.

Question 13.

There are four materials A, B, C and D. A and D are hard and shiny, but B and C are dull and not very hard. Identify the metals and non-metals from A, B, C and D.

Answer:

A and D are metals.

B and C are non-metals.

Question 14.

Gaurav knows that wires can be made from copper and aluminium. He tries to make wire . from sulphur and carbon. Will he succeed ? Give reason also.

Answer:

No, he will not succeed because sulphur and carbon are non-metals. Non-metals are not ductile, that is, they cannot be drawn into wires.

NCERT Solutions for Class 8 Science Chapter 4 - 3 Mark Questions and Answers

Question 1.

1. Identify the most reactive and least reactive metal amongst the followings : Al, K, Cu, Au.
2. An iron knife kept dipped in blue copper sulphate solution changes to light green. Why ? Write the equation also. [KVS 2005]

Answer:

1. Most reactive metal is K and least reactive metal is Au.
2. An iron knife kept dipped in blue copper sulphate solution changes to light green because iron replaces copper from copper sulphate and forms iron sulphate. This happens because iron is more reactive than copper.

$$\text{Fe} + \text{CuSO}_4 \longrightarrow \text{FeSO}_4 + \text{Cu}$$

Question 2.

Give reasons, why :

1. Silver is used in jewellery.
2. Copper is used in electrical wiring.
3. Sodium is stored in kerosene oil.

Answer:

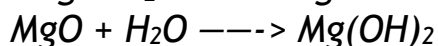
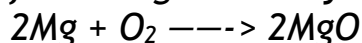
1. Silver does not corrode and it is malleable and ductile, therefore, it can be used in jewellery.
2. Copper is used in electrical wiring because it is a good conductor of electricity.
3. Sodium has low ignition temperature. It oxidises quickly and bums when exposed to air. It can only be stored in a liquid hydrocarbon like mineral oil or kerosene oil.

Question 3.

Taking examples of magnesium and sulphur explain how metals and non-metals produce oxides with different characteristics.

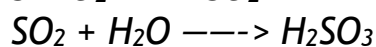
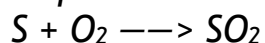
Answer:

Magnesium bums in oxygen to form magnesium oxide, which dissolves in water to form magnesium hydroxide - an alkali.



Magnesium hydroxide changes red litmus into blue.

Sulphur bums in air to form sulphur dioxide, which dissolves in water to form sulphurous acid - an acid which turns blue litmus into red.



Question 4.

Compare the following chemical properties of metals and non-metals.

1. Formation of ions

2. *Action with dilute acids*
3. *Action with hydrogen.*

Answer:

1. *Formation of ions.*
Metals form cations whereas non-metals form anions.
2. *Action with dilute acids.*
Metals react with dilute mineral acid to liberate hydrogen.
Non-metals do not react with dilute mineral acids.
3. *Action with hydrogen.*
Metals do not react with hydrogen but non-metals react with hydrogen to form hydrides.