

Chapter 6: Physical and Chemical Changes

NCERT Exemplar · Class 7 · Science

Multiple Choice Questions

Question 1

Which of the following is a physical change?

A.

Rusting of iron

B.

Combustion of magnesium ribbon

C.

Burning of candle

D.

Melting of wax

Answer

Correct option: D

Solution

Ans: (d) Melting of wax

Explanation: A physical change occurs when the physical form of a substance changes but not its chemical content. In most cases, physical alterations can be reversed. Only the conversion of ice into water is an example of a physical change that can be reversed when we look at the possibilities provided.

Question 2

Which of the following is a chemical change?

A.

Twinkling of stars

B.

Cooking of vegetables

C.

Cutting of fruits

D.

Boiling of water

Answer

Correct option: B

Solution

Ans: (b) Cooking of vegetables

Explanation: A chemical reaction produces a chemical change. When matter changes shapes but not chemical identity, this is referred to as physical transformation. A physical alteration simply impacts physical properties, such as shape, size, and so on. If the chemical makeup changes, it is a chemical change; if the chemical composition remains constant, it is a physical change. Physical changes include the twinkling of stars, the chopping of fruits, and the boiling of water.

Question 3

A chemical change may involve –

A.

Change in colour only

B.

Change in temperature only

C.

Evolution of gas only

D.

Any or all of the above

Answer

Correct option: D

Solution

Ans: (d) Any or all of the above

Explanation: The chemical change could result in a change in colour, temperature, or the evolution of a gas, among other things.

Question 4

Which of the following is/are true when milk changes into curd?

(i) Its state is changed from liquid to semi solid.

(ii) It changes colour.

(iii) It changes taste.

(iv) The change cannot be reversed.

Choose the correct option from below :

A.

(i) and (ii) are correct

B.

(ii) and (iii) are correct

C.

(i), (iii) and (iv) are correct

D.

(i) to (iv) are correct

Answer

Correct option: C

Solution

Ans: (c) (i), (iii) and (iv) are correct

Explanation: The physical state of curd differs from that of milk. The taste of milk and curd is also distinct. The chemical reaction that converts milk to curd is irreversible.

Question 5

A man painted his main gate made up of iron, to

(i) Prevent it from rusting.

(ii) Protect it from the sun.

(iii) Make it look beautiful.

(iv) Make it dust free.

Which of the above statement(s) is/are correct?

A.

(i) and (ii)

B.

(ii) and (iii)

C.

only (ii)

D.

(i) and (iii)

Answer

Correct option: D

Solution

Ans: (d) (i) and (iii)

Explanation: It is vital to paint iron to keep it from rusting and to make it seem nice.

Question 6

Iron pillar near the Qutub Minar in Delhi is famous for the following facts. Which of these facts is responsible for its long stability?

A.

It is more than 7 metres high.

B.

It weighs about 6000 kg.

C.

It was built more than 1600 years ago.

D.

It has not rusted after such a long period

Answer

Correct option: D

Solution

Ans: (d) It has not rusted after such a long period

Explanation: The 'iron pillar' is notable for not rusting after such a long time.

Question 7

Galvanisation is a process used to prevent the rusting of which of the following?

A.

Iron

B.

Zinc

C.

Aluminium

D.

Copper

Answer

Correct option: A

Solution

Ans: (a) Iron

Explanation: 'Galvanisation' is a process used to keep 'iron' from rusting. In this technique, we put a layer of 'zinc' to the surface of the iron.

Question 8

Paheli's mother made a concentrated sugar syrup by dissolving sugar in hot water. On cooling, crystals of sugar got separated. This indicates a –

A.

Physical change that can be reversed.

B.

Chemical change that can be reversed.

C.

Physical change that cannot be reversed.

D.

Chemical change that cannot be reversed.

Answer

Correct option: A

Solution

Ans: (a) physical change that can be reversed.

Explanation: The presented circumstance denotes physical change that is reversible.

Question 9

Which of the following statements is incorrect for a chemical reaction?

A.

Heat may be given out but never absorbed.

B.

Sound may be produced.

C.

A colour change may take place.

D.

A gas may be evolved.

Answer

Correct option: A

Solution

Ans: (a) Heat may be given out but never absorbed.

Explanation: Depending on the nature of the reaction, heat can be given or absorbed in a chemical reaction.

Question 10

Two drops of dilute sulphuric acid were added to 1 g of copper sulphate powder and then a small amount of hot water was added to dissolve it (step I). On cooling, beautiful blue coloured crystals got separated (step II). Step I and step II are:

A.

Physical and chemical changes respectively.

B.

Chemical and physical changes respectively.

C.

Both physical changes.

D.

Both chemicals change.

Answer

Correct option: C

Solution

Ans: (c) Both physical changes.

Explanation: A chemical change occurs when 'copper sulphate powder' dissolves in water in the presence of 'sulphuric acid.' While cooling the obtained hot solution, the crystals of 'copper sulphate' will separate.

Very Short Answer Questions

Question 11

State whether the following statements are true or false:

- (a) When a candle burns, both physical and chemical changes take place.
- (b) Anaerobic bacteria digest animal waste and produce biogas.
- (c) Ships suffer a lot of damage though they are painted.
- (d) Stretching of rubber band is not a physical change.

Solution

Ans:

- (a) The given statement is true.
- (b) The given statement is true.
- (c) The given statement is true.
- (d) The given statement is false. Stretching of a rubber band is a 'physical change'.

Question 12

Melting of wax is a change where a solid changes to liquid state. Give one more such change which you observe in your surroundings.

Solution

Ans: When a candle is lit, two things happen at the same time. The first step is to melt the wax, and the second step is to burn the wax. In these cases, melting wax is a physical change, whereas burning wax

is a chemical reaction. Because burning causes oxidation of wax, which is a chemical change. Another example, according to the provided criteria, is 'Melting of ice.'

Question 13

What kind of change is shown by tearing of paper?

Solution

Ans: Paper tearing is a physical change that cannot be undone.

Short Answer Questions

Question 14

Match the items of Column I with the items of Column II.

Column I	Column II
a) Large crystals	i) Turns lime water milky
b) Depositing a layer of zinc on iron.	ii) Physical change
c) Souring of milk	iii) Rust
d) Carbon dioxide	iv) Sugar candy (mishri)
e) Iron oxide	v) Chemical change
f) Dissolving common salt in water	vi) Galvanisation

Solution

Ans: The arranged table is given below:

Column I	Column II
a) Large crystals	iv) Sugar candy (mishri)
b) Depositing a layer of zinc on iron.	vi) Galvanisation
c) Souring of milk	v) Chemical change
d) Carbon dioxide	i) Turns lime water milky
e) Iron oxide	iii) Rust
f) Dissolving common salt in water	ii) Physical change

Question 15

Fill in the blanks in the following statements using the words given in the box.

rusted, colourful, substance, chemical, physical, reversible, iron oxide, object

(a) Making sugar solution is a _____ change.

(b) A physical change is generally _____.

(c) Grinding of wheat grain changes its size. It is a _____ change.

(d) Iron benches kept in lawns and gardens get _____. It is a _____ change because a new _____ is formed.

Solution

Ans: Making sugar solution is a physical change.

Ans: A physical change is generally reversible.

Ans: Grinding wheat grain changes its size. It is a physical change.

Ans: Iron benches kept in lawns and gardens get rusted. It is a chemical change because a new substance is formed.

Question 16

Classify the following processes into physical or chemical changes:

(i) Beating of aluminium metal to make aluminium foil.

(ii) Digestion of food.

(iii) Cutting of a log of wood into pieces.

(iv) Burning of crackers.

Solution

Ans:

(i) Beating of aluminium metal to make aluminium foil: Physical change.

(ii) Digestion of food: Chemical change

(iii) Cutting of a log of wood into pieces: Physical change

(iv) Burning of crackers: Chemical change

Question 17

Write word equations for two chemical reactions with the help of materials given in the box.

Air, copper sulphate, iron, vinegar, iron oxide, carbon dioxide, iron sulphate, copper, lime water, water

Solution

Ans: The reactions are given below:

Iron + Air + water → Iron oxide and

Copper sulphate + Iron → Iron sulphate + copper

Question 18

Explain the following:

- (a) Lime water turns milky on passing carbon dioxide gas into it.
- (b) Bubbles are produced when acetic acid is added to a solution of sodium hydrogen carbonate.

Solution

Ans: When carbon dioxide gas is introduced into lime water, a white precipitate of 'calcium carbonate' is formed. This comment elicited the following response:

Calcium hydroxide + Carbon dioxide → Calcium carbonate + water

Ans: The chemical interaction between 'acetic acid' and 'sodium hydrogen carbonate' produces 'carbon dioxide.' This comment elicited the following response:

Sodium hydrogen carbonate + Acetic acid → Sodium carbonate + water + Carbon dioxide

Long Answer Questions

Question 19

Give two examples for each of the following cases:

- (a) Physical changes which are reversible.
- (b) Physical changes which are not reversible.
- (c) Chemical changes.

Solution

Ans: Physical changes which are reversible:

- i) Melting of ice.
- ii) Folding of clothes.

Ans: Physical changes which are not reversible:

- i) Breaking a bottle.
- ii) Cutting of trees.

Ans: Chemical changes:

i) Burning wood.

ii) Digesting food

Question 20

Give an example of a chemical reaction for each of the following situations:

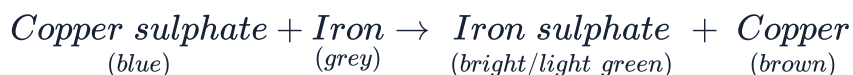
(a) A change in colour is observed.

(b) A gas has evolved.

(c) Sound is produced.

Solution

Ans: The chemical reaction between 'copper sulphate' solution and iron metal results in a colour shift. Because of the creation of iron sulphate, the blue colour of 'copper sulphate' changes to vivid green in this chemical reaction. The response is,



Ans: When 'baking soda' and 'vinegar' are mixed, a chemical reaction occurs. Following this, bubbles of 'carbon dioxide' gas, combined with another material, are generated. The response is,



Ans: Burning crackers also generate a loud sound.

Question 21

If you leave a piece of iron in the open for a few days, it acquires a film of brownish substance, called rust.

(a) Do you think rust is different from iron?

(b) Can you change rust back into iron by some simple method?

(c) Do you think the formation of rust from iron is a chemical change?

(d) Give two other examples of a similar type of change.

Solution

Ans: Rust is brown dust made up of 'iron oxide.' Rust, on the other hand, is not the same as iron.

Ans: No, rusting is a chemical reaction that is irreversible.

Ans: In the presence of moisture, iron rusts and combines with oxygen. This results in the formation of a new chemical known as 'iron oxide.' Rust is another name for iron oxide.

Ans: The following are two examples:

(i) Production of 'magnesium oxide' by burning 'magnesium ribbon'.

(ii) The formation of curd from milk.

Question 22

A student took a solution of copper sulphate in a beaker and put a clean iron nail into it and left it for about an hour.

(a) What changes do you expect?

(b) Are these changes chemical in nature?

(c) Write a word equation for the chemical change, if any.

Solution

Ans: The following are the expected changes based on the supplied statement:

(i) The colour changes from blue to green.

(ii) A brown colour deposit is discovered on an iron nail (surface).

Ans: Yes, these alterations are chemical in nature. The reason for this is that the reaction produces 'iron sulphate' and copper.

Ans: The reaction is:



