

Physical and Chemical Changes

1. In a pressure-kerosene stove,
(i) We pump kerosene and convert it into vapours.
(ii) The vapours are then ignited.
Which of the following is true about the above statements?

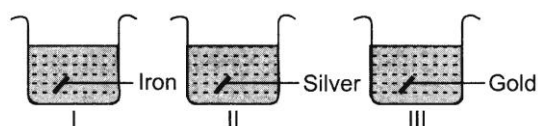
(a) (i) is a chemical change; (ii) is a physical change,
(b) (i) is a physical change; (ii) is a chemical change.
(c) Both (i) and (ii) are physical changes.
(d) Both (i) and (ii) are chemical changes.

2. Which of the following statements is correct about the given changes?

(i) Drawing copper into a wire
(ii) Breaking of a glass
(iii) Heating an iron nail till red hot
(iv) Inflating a basketball

(a) (i) and (ii) are chemical changes while (iii) and (iv) are physical changes.
(b) (ii) and (iii) are chemical changes while (i) and (iv) are physical changes,
(c) All are physical changes.
(d) All are chemical changes.

3. Vishakha took few wire pieces made up of different metals and placed them in blue solution of copper sulphate. What will be the changes in the colour of the solutions present in beakers I, II and III?



I	II	III
(a) Green	Blue	Green
(b) Blue	Green	Green
(c) Green	Blue	Blue
(d) Blue	Blue	Blue

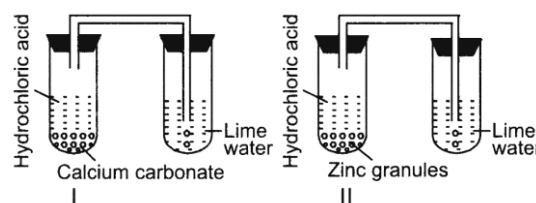
4. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
(P) Expansion of metals on heating	(i) Neither physical nor chemical change
(Q) A stone kept in the sunlight	(ii) Chemical change

(R) Burning of a candle	(iii) Combination of physical and chemical changes
(S) Curdling of milk	(iv) Physical change

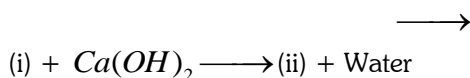
(a) (P) - (iv), (Q) - (i), (R) - (iii), (S) - (ii)
(b) (P) - (iv), (Q) - (iii), (R) - (ii), (S) - (i)
(c) (P) - (i), (Q) - (ii), (R) - (iii), (S) - (iv)
(d) (P) - (i), (Q) - (iv), (R) - (ii), (S) - (iii)

5. Kanav took two test tubes marked as I and II. In test tube I, he put calcium carbonate and hydrochloric acid while in test tube II, he put zinc granules and hydrochloric acid. He passed the gas coming out from both the test tubes in lime water. What would be his observation?



(a) The gas coming out from test tube I turned lime water milky.
(b) The gas coming out from test tube II turned lime water milky.
(c) The gases coming out from both the test tubes turned lime water milky.
(d) None of these.

6. Observe the given reaction sequence carefully.
Acetic acid + Sodium hydrogen carbonate



What could (i) and (ii) be?

(i)	(ii)
(a) $CaCO_3$	CO_2
(b) H_2O	$CaCO_3$
(c) CO_2	$CaCO_3$
(d) H_2O	CO_2

7. The ash which is collected after burning of magnesium ribbon is dissolved in water to give a solution X. What is the nature of the solution X when it is tested with indicators?

- (a) It turns blue litmus red and phenolphthalein pink, hence it is an acidic solution.
 (b) It turns red litmus blue and phenolphthalein pink, hence it is a basic solution.
 (c) It turns blue litmus red and gives no colour with phenolphthalein, hence it is an acidic solution.
 (d) It does not change colour of red or blue litmus and phenolphthalein, hence it is a neutral solution.

8. Fill in the blanks by choosing an appropriate option.

When sugar is dissolved in water, it undergoes a (i) change but if sugar is heated in a test tube over the Bunsen burner flame, it first melts, turns brown and finally turns (ii). The new substance formed is (iii) and the change is a (iv) change.

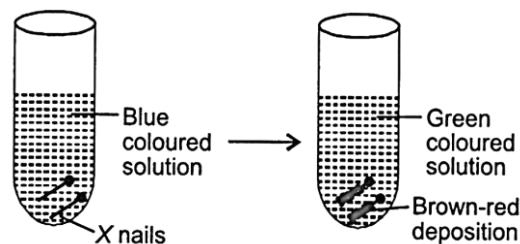
(i)	(ii)	(iii)	(iv)
(a) Physical, reversible	Black	Charcoal	Chemical, irreversible
(b) Physical, irreversible	Black	Coal	Chemical, irreversible
(c) Physical, irreversible	Red	Charcoal	Chemical, reversible
(d) Physical, reversible	Red	Coal	Chemical, reversible

9. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
(P) Dipping iron sheets in molten zinc	(i) Alloying
(Q) Prevents the iron surface to come in contact with moisture	(ii) Galvanisation
(R) Two or more metals are mixed in definite ratio to form a homogeneous mixture	(iii) Tinning
(S) Coating expensive utensils with tin	(iv) Painting

- (a) (P)-(iv), (Q)-(i), (R)-(ii), (S)-(iii)
 (b) (P)-(iii), (Q)-(i), (R)-(ii), (S)-(iv)
 (c) (P)-(ii), (Q)-(iv), (R)-(i), (S)-(iii)
 (d) (P)-(i), (Q)-(iii), (R)-(ii), (S)-(iv)

10. Study the given figure carefully.



Which of the following reactions explains the above change most appropriately?

- (a) $ZnSO_4 + Cu \rightarrow CuSO_4 + Zn$
 (b) $CuSO_4 + Fe \rightarrow FeSO_4 + Cu$
 (c) $FeSO_4 + Cu \rightarrow CuSO_4 + Fe$
 (d) $CuSO_4 + Zn \rightarrow ZnSO_4 + Cu$

11. Kirti kept a metal spoon in a glass jar filled with pickle for a few days. She observed that there were holes in the spoon. What could be the possible reason for this?

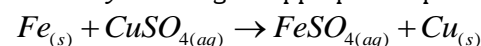
- (a) Oil present in pickle dissolves the metal.
 (b) Oil present in pickle liberates a gas in which metal gets dissolved.
 (c) Metal reacts with acid present in pickle to form salt hence, metal gets dissolved.
 (d) The glass reacts with metal to give acid which dissolves the metal.

12. Which of the following do not represent that a chemical change is taking place?

- I. A gas is produced.
 II. Precipitate is formed.
 III. State of a substance changes
 IV. A new odour is produced.
 V. Shape of a substance changes

- (a) I and V only (b) I and IV only
 (c) II, III and V only (d) III and V only

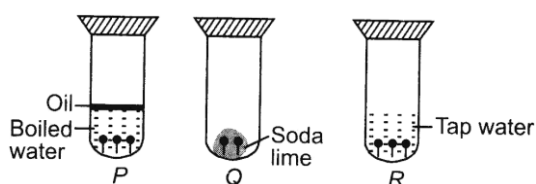
13. Observe the given reaction carefully and fill in the blanks by choosing an appropriate option.



Before reaction, iron is (i) in colour and solution is (ii) in colour. After reaction iron gets (iii) deposits and the solution becomes (iv) in colour.

(i)	(ii)	(iii)	(iv)
(a) Grey	Colourless	Red	Blue
(b) Red	Blue	Grey	Green
(c) Grey	Blue	Brown	Green
(d) Red	Colourless	Grey	Green

14. Observe the given experimental set-up carefully.



In which test tubes rusting of iron nails will not take place?

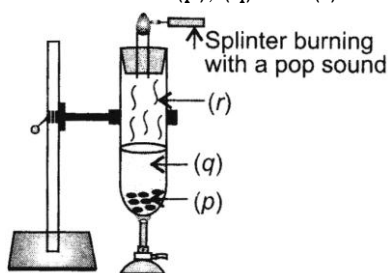
- (a) P and Q only (b) Q and R only
(c) P and R only (d) All of these

15. Kunal took few iron turnings and mixed them well with sulphur powder. He could separate the iron turnings with the help of a magnet. He heated the mixture for some time and tried to separate the iron turnings with the magnet but he could not. Why?

- (a) On heating, a chemical change takes place and a new compound is formed.
(b) On heating, iron becomes non-magnetic hence, it is not attracted by magnet.
(c) On heating, a physical change takes place hence iron and sulphur gets mixed up.
(d) On heating, iron evaporates and only sulphur is left behind.

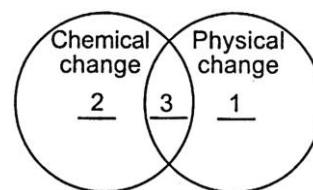
Achievers Section (HOTS)

16. Observe the given figure carefully and identify the substances marked as (p), (q) and (r).



(p)	(g)	(r)
(a) Zinc	Water	Carbon dioxide
(b) Magnesium	Hydrochloric acid	Oxygen
(c) Magnesium	Water	Carbon dioxide
(d) Zinc	Hydrochloric acid	Hydrogen

17. Study the given Venn diagram carefully.



Identify 1, 2 and 3.

1	2	3
(a) Melting of ice	Rusting of iron	Cutting a log of wood
(b) Glowing of bulb	Bursting of tyre	Crystallisation
(c) Stitching of garments	Burning a matchstick	Burning of a candle
(d) Melting of ice	Decomposition of sugar	Sublimation

18. Rupali classified a few changes occurring around us as shown in the table.

S. No.	Change	Chemical	Physical	Reversible
1.	Grinding of wheat	✓	×	×
2.	Bursting of crackers	✓	×	×
3.	Formation of clouds	×	✓	✓
4.	Germination of seeds	✓	×	✓
5.	Drying of wet clothes	×	✓	×

Which of her observations are incorrect?

- (a) 1 and 2 only (b) 2 and 3 only
(c) 1, 4 and 5 only (d) All of these.

19. Read the given statements and select the correct option.

Statement 1: Many cut fruits, when kept in open turn brown.

Statement 2: Browning of fruits is due to a chemical reaction.

- (a) Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
(b) Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
(c) Statement 1 is true and statement 2 is false.
(d) Both statements 1 and 2 are false.

20. During the science activity, Ms Prabha demonstrated an experiment in following steps:

Step 1: She burned a substance X over the candle flame and white dazzling light was observed. Also white powdery ash was left behind.

Step 2: She mixed the white ash formed with small amount of water. Then she dipped red and blue litmus papers into the solution one by one.

Which of the following observations are correct?

I. The substance burned in step 1 was magnesium.

II. The white ash formed in step 1 was magnesium oxide.

III. The solution formed in step 2 was acidic in nature

IV. The solution formed in step 2 turned blue litmus red.

(a) I and II only

(b) III and IV only

(c) I, II and III only

(d) II, III and IV only

Answer key

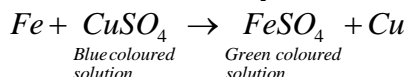
1. B	2. C	3. C	4. A	5. A
6. C	7. B	8. A	9. C	10. B
11. C	12. D	13. C	14. A	15. A
16. D	17. C	18. C	19. A	20. A

HINTS & EXPLANATIONS

1. (b): Pumping kerosene and conversion to its vapours involve change in the state only (from liquid to vapours) and no new substance is formed. So, it is a physical change. During ignition of vapours, a lot of heat is given out and new substances are formed. Therefore, it is a chemical change.

2. (c): All the changes are physical changes as no new substance is formed.

3. (c): As iron is more reactive than copper, it displaces copper from copper sulphate solution and green solution of iron sulphate is formed.

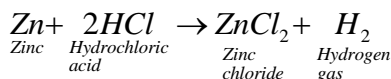
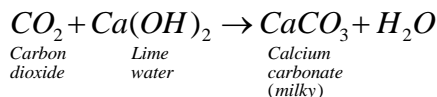


Silver and gold are less reactive than copper. So, they do not displace copper from copper sulphate solution. Hence, solution remains blue in colour.

4. (a) Not Available

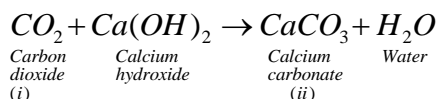
5. (a):
- $$\underset{\substack{\text{Calcium} \\ \text{carbonate}}}{CaCO_3} + \underset{\substack{\text{Hydrochloric} \\ \text{acid}}}{2HCl} \rightarrow \underset{\substack{\text{Calcium} \\ \text{chloride}}}{CaCl_2} + \underset{\substack{\text{Carbon} \\ \text{dioxide}}}{CO_2} + \underset{\substack{\text{Water}}}{H_2O}$$

Carbon dioxide gas turns lime water milky.

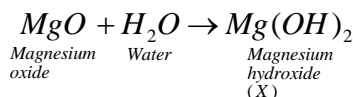


H_2 gas does not lime water milky.

6. (c) $\underset{\substack{\text{Acetic acid}}}{CH_3COOH} + \underset{\substack{\text{Sodium hydrogen} \\ \text{carbonate}}}{NaHCO_3}$

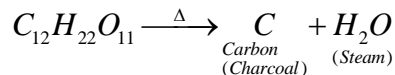


7. (b) $\underset{\substack{\text{Magnesium} \\ \text{oxide}}}{Mg} + \underset{\substack{\text{Oxygen}}}{O_2} \rightarrow \underset{\substack{\text{Magnesium} \\ \text{oxide(ash)}}}{MgO}$



$Mg(OH)_2$ solution is basic in nature which turns red litmus blue and phenolphthalein pink.

8. (a): Dissolving sugar in water is a physical, reversible change. When sugar is heated, it decomposes into carbon and water (chemical reversible change).



9. (c) Not Available

10. (b): The blue coloured solution is $CuSO_4$ solution. Iron (Fe) is more reactive than copper (Cu). So, Fe displaces Cu from the $CuSO_4$ solution and forming $FeSO_4$ solution which is green in colour. Brown-red deposition in test tube is of copper. Such type of reactions are called displacement reactions,

11. (c) Not Available

12. (d): Change in state or shape of a substance is a physical change.

13. (c): $\underset{\substack{\text{(Grey)}}}{Fe_{(s)}} + \underset{\substack{\text{(Blue)}}}{CuSO_{4(aq)}} \rightarrow \underset{\substack{\text{(Green)}}}{FeSO_{4(aq)}} + \underset{\substack{\text{(Brown)}}}{Cu_{(s)}}$

14. (a): In test tube P, iron nails do not rust because boiled water does not contain any oxygen. A thin layer of oil also prevents oxygen from reaching the water in the test tube. In test tube Q, iron nails do not rust because soda lime absorbs water vapours.

In test tube R, iron nails will rust because water and oxygen both are available.

15. (a): $\underset{\substack{\text{Iron}}}{Fe} + \underset{\substack{\text{Sulphur}}}{S} \xrightarrow{\text{Heat}} \underset{\substack{\text{Iron sulphide}}}{FeS}$

On heating iron and sulphur, a new substance, iron sulphide is formed, so it is a chemical change.

16. (d): $\underset{\substack{\text{Zinc}}}{Zn} + \underset{\substack{\text{Hydrochloric} \\ \text{acid}}}{2HCl} \rightarrow \underset{\substack{\text{Zinc} \\ \text{chloride}}}{ZnCl_2} + \underset{\substack{\text{Hydrogen}}}{H_2}$

Hydrogen gas burns with a pop sound when burning splinter is brought near it.

17. (c): Stitching of garments is a physical change, burning a matchstick is a chemical change and burning of a candle involves both physical and chemical changes.

18. (c) Not Available

19. (a): When fruits are cut, iron present in the fruit reacts with oxygen in the air to form brown substance.

20. (a) Not Available