



SUBJECT NAME - CHEMISTRY
GRADE- X

QUESTION BANK

CHAPTER 1

CHEMICAL REACTIONS AND EQUATIONS

MCQ Type Questions

1. Some crystals of copper sulphate were dissolved in water. The color of the solution obtained would be

- (a) Green
- (b) Red
- (c) Blue
- (d) Brown

2. When dilute HCl is added to zinc pieces taken in a test tube

- (a) No change takes place
- (b) The colour of the solution becomes yellow
- (c) A pungent smelling gas gets liberated
- (d) A small bubble of H_2 gas appears on the surface of zinc pieces.

3. PbS reacts with ozone (O_3) and forms $PbSO_4$. As per the balanced equation, molecules of ozone required for every one molecule of PbS is/are

- (a) 4
- (b) 3
- (c) 2
- (d) 1



4. Chemically rust is
- (a) Hydrated ferrous oxide
 - (b) Hydrated ferric oxide
 - (c) Only ferric oxide
 - (d) None of these
5. Which of the following reactions is not correct
- (a) $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$
 - (b) $2 \text{Ag} + \text{Cu}(\text{NO}_3)_2 \rightarrow 2 \text{AgNO}_3 + \text{Cu}$
 - (c) $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$
 - (d) $\text{Mg} + 2 \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
6. Copper displaces which of the following metals from its salt solution:
- (a) ZnSO_4
 - (b) FeSO_4
 - (c) AgNO_3
 - (d) NiSO_4
7. In an electric cell where electrolysis is carried out, anode has:
- (a) Positive charge
 - (b) Negative charge
 - (c) Connected to negative terminal of the battery
 - (d) None of these is correct
8. The reaction $\text{H}_2 + \text{Cl}_2 \rightarrow 2 \text{HCl}$ represents:
- (a) oxidation
 - (b) reduction
 - (c) decomposition
 - (d) combination
9. In the reaction $\text{PbO} + \text{C} \rightarrow \text{Pb} + \text{CO}$
- (a) PbO is oxidized
 - (b) C act as an oxidizing agent
 - (c) C act as a reducing agent
 - (d) Reaction does not represent redox reaction



10. A substance which oxidizes itself and reduces other is known as

- (a) Oxidizing agent
- (b) Reducing agent
- (c) Both (a) and (b)
- (d) None of these.

11. Take about 5 ml of dil.HCl in a test tube and add a few pieces of fine granules of zinc in it. Which gas is evolved?

- (a) Chlorine
- (b) Hydrogen
- (c) HCl
- (d) Nitrogen

12. Dissolving sugar is an example of:

- (a) Physical change
- (b) Chemical change
- (c) Redox reaction
- (d) None of these

13. Heat is evolved during:

- (a) Endothermic reaction
- (b) Displacement reaction
- (c) Combustion reaction
- (d) Combination reaction

14. Which of the following is not a balanced equation?

- (a) $\text{Fe} + \text{Cl}_2 \rightarrow \text{FeCl}_3$
- (b) $\text{Mg} + \text{CuSO}_4 \rightarrow \text{MgSO}_4 + \text{Cu}$
- (c) $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
- (d) $\text{Zn} + \text{S} \rightarrow \text{ZnS}$



15. The reaction between lead nitrate and potassium iodide present in aqueous solution is an example of
- (a) Decomposition reaction
 - (b) Displacement reaction
 - (c) Double displacement reaction
 - (d) Neutralization reaction
16. What happens when dilute hydrochloric acid is added to iron filings?
- (a) hydrogen gas and iron chloride are produced
 - (b) chlorine gas and iron hydroxides are produced
 - (c) no reaction takes place
 - (d) iron salt and water are produced.
17. Which of the following gases can be used for the storage of fresh sample of an oil for a longer time?
- (a) Carbon dioxide or oxygen
 - (b) Nitrogen or helium
 - (c) Helium or oxygen
 - (d) Nitrogen or oxygen.
18. In the decomposition of lead (II) nitrate to give lead (II) oxide, nitrogen dioxide and oxygen gas, the coefficient of nitrogen dioxide (in the balanced equation) is
- (a) 1
 - (b) 2
 - (c) 3
 - (d) 4
19. We store silver chloride in dark coloured bottles because it is
- (a) A white solid
 - (b) Undergoes redox reaction
 - (c) To avoid action by sunlight
 - (d) None of the above.



20. Silver articles turn black when kept in the open for a few days due to formation of

- (a) H_2S
- (b) AgS
- (c) $AgSO_4$
- (d) Ag_2S

Very Short Answer Type Question [1 mark]

One Sentence Answer

1. What is a redox reaction?
2. What is corrosion? Explain its advantage and disadvantage.
3. What is rancidity? How can we reduce the problem of rancidity?
4. How is corrosion different from rusting?
5. What is meant by endothermic and exothermic reactions? Give suitable example for each.
6. Define different types of chemical reaction and give examples for each.
7. Why is photosynthesis considered as an endothermic reaction?
8. In electrolysis of water, why is the volume of gas collected over one electrode double that of the other electrode?
9. What happens when water is added to solid calcium oxide taken in a container?
Write a chemical formula for the same.
10. Give three types of decomposition reaction.
11. Name the compound used for testing CO_2 -gas.

Direction (Q12 to 16): In the following Questions, the Assertion and Reason have been put forward. Read the statements carefully and choose the correct alternative from the following:

- (a) Both the Assertion and Reason are correct and the reason is the correct explanation of the Assertion.
- (b) The Assertion and the reason are correct but the Reason is not the correct explanation of the Assertion.
- (c) Assertion is true but the Reason is false.
- (d) The statement of the Assertion is false but the reason is true.

12. Assertion: $AgBr$ is used on photographic and X-ray film

Reason: $AgBr$ is photosensitive and changes to Ag and bromine in presence of sunlight and undergoes decomposition reaction.



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13. Assertion: Magnesium ribbon keeps on burning in atmosphere of nitrogen.
Reason: Magnesium reacts with nitrogen to form magnesium nitride and this reaction is combination reaction.

14. Assertion: Zinc reacts with sulphuric acid to form to form zinc sulphate and Hydrogen gas and it is displacement reaction.
Reason: Zinc reacts with oxygen to form Zinc oxide

15. Assertion: $MnO_2 + 4 HCl \rightarrow MnCl_2 + Cl_2 + 2 H_2O$ is redox reaction.
Reason: MnO_2 oxidises HCl to Cl_2 and gets reduced to $MnCl_2$

16. Assertion: lead nitrate on thermal decomposition gives lead oxide , brown coloured nitrogen dioxide and oxygen gas .
Reason: Lead nitrate reacts with potassium iodide to form yellow ppt of lead iodide and the reaction is double displacement as well as precipitation reaction.

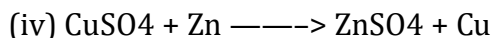
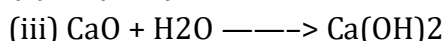
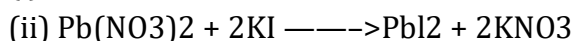
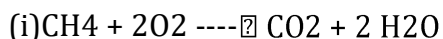
Very Short Answer Type Questions [2 Marks]

1. "We need to balance a skeletal chemical equation." Give reason to justify the statement.
2. Giving an example list two information which make a chemical equation more useful (informative).
3. Name the reducing agent in the following reaction:
 $3MnO_2 + 4Al \rightarrow 3Mn + 2Al_2O_3$
State which is more reactive, Mn or Al and why?
4. (i) Write a balanced chemical equation for process of photosynthesis.
(ii) When do desert plants take up carbon dioxide and perform photosynthesis?
5. What is observed when a solution of potassium iodide solution is added to a solution of lead nitrate? Name the type of reaction. Write a balanced chemical equation to represent the above chemical reaction.
6. Write balanced chemical equations for the following reactions.
(i) Silver bromide on exposure to sunlight decomposes into silver and bromine,
(ii) Sodium metal reacts with water to form sodium hydroxide and hydrogen gas.



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7. Identify the type of reaction(s) in the following equations.



8. Write balanced equation for the reaction between magnesium and hydrochloric acid. Name the products obtained, identify the type of reaction.

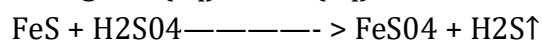
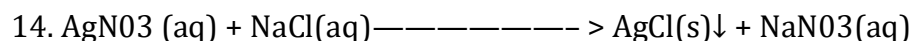
9. Describe an activity to observe what happens when quick lime is added to water taken in a beaker. State two important observations and name the type of reaction taking place.

10. What is the colour of ferrous sulphate crystals? How does this colour change after heating?

11. Why does the colour of copper sulphate solution change when an iron nail is dipped in it? Write two observations.

12. Translate the following statement into chemical equation and then balance it :
Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate. State the two types in which this reaction can be classified.

13. Why decomposition reactions are called the opposite of combination reactions? Write equations for these reactions.



Consider the above mentioned two chemical equations with two different kinds of arrows (\uparrow and \downarrow) along with product. What do these two different arrows indicate?

15. Hydrogen being a highly inflammable gas and oxygen being a supporter of combustion, yet water which is a compound made up of hydrogen and oxygen is used to extinguish fire. Why?

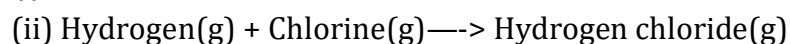
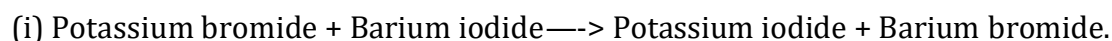
16. Using a suitable chemical equation, justify that some chemical reactions are determined by:

(i) change in colour, (ii) change in temperature.

17. (a) A solution of substance 'X' is used for white washing. What is the substance 'X'? State the chemical reaction of 'X' with water.

(b) Why does the colour of copper sulphate solution change when an iron nail is dipped in it?

18. Write the balanced equation for the following reaction and identify the type of reaction in each case.





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19. A zinc plate was put into a solution of copper sulphate kept in a glass container. It was found that blue colour of the solution gets fader and fader with the passage of time. After few days, when zinc plate was taken out of the solution, a number of holes were observed on it.

(i) State the reason for changes observed on the zinc plate.

(ii) Write the chemical equation for the reaction involved.

20. A white salt on heating decomposes to give brown fumes and a residue is left behind.

(i) Name the salt.

(ii) Write the equation for the decomposition reaction.

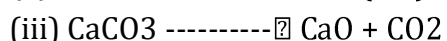
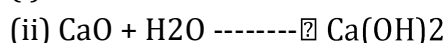
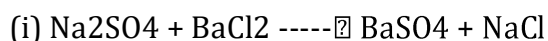
21. When a solution of potassium iodide is added to a solution of lead nitrate in a test tube, a reaction takes place.

(a) What type of reaction is this?

(b) Write a balanced chemical equation to represent the above reaction.

22. Define combination reaction. Give one example of a combination reaction which is also exothermic

23. (a) Classify the following reactions into different types.



(b) Which of the above reaction(s) is/are precipitation reaction(s)? Why a reaction is called precipitation reaction?

24. Write a balanced chemical equation for the reaction between sodium chloride and silver nitrate indicating the physical state of the reactants and the products.

25. What is a redox reaction? When a magnesium ribbon burns in air with a dazzling flame and forms a white ash, is magnesium oxidized or reduced?

Why?

26. Write any two observations in an activity which may suggest that a chemical reaction has taken place. Give an example in support of your answer.

27. When the powder of a common metal is heated in an open china dish, its colour turns black. However, when hydrogen is passed over the hot black substance so formed, it regains its original colour. Based on the above information, answer the following questions.

I. What type of chemical reaction takes place in each of the two given steps?

II. Name the metal initially taken in the powder form. Write balanced chemical equations for both reactions.

28. In electrolysis of water, why is the volume of gas collected over one electrode double that of gas collected over the other electrode?



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29. Name the products formed on strongly heating ferrous sulphate crystals. What type of chemical reaction occurs in this change?

30. What is an oxidation reaction? Give an example of oxidation reaction. Is oxidation an exothermic or an endothermic reaction?

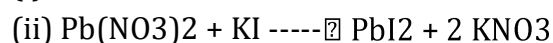
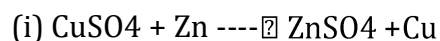
31. Describe an activity to demonstrate the change that takes place when white silver chloride is kept in sunlight. State the type of chemical reaction which takes place.

32. When magnesium ribbon burns in air or oxygen, a product is formed. State the type of chemical reaction and name the product formed in the reaction.

Write balanced chemical equation of this reaction.

33. Distinguish between a displacement reaction and a double displacement reaction.

Identify the displacement and the double displacement reaction from the following reactions.



Short Answer Type Questions (II) [3 Marks]

34. Write the chemical equation of the reaction in which the following changes have taken place with an example of each:

(i) Change in colour

(ii) Change in temperature

(iii) Formation of precipitate

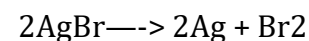
35. State the type of chemical reactions and chemical equations that take place in the following:

(i) Magnesium wire is burnt in air.

(ii) Electric current is passed through water.

(iii) Ammonia and hydrogen chloride gases are mixed.

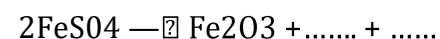
36. (a) Write the essential condition for the following reaction to take place:



Write one application of this reaction.

(b) Complete the following chemical equation of a chemical reaction

Heat



(c) What happens when water is added to quick lime? Write chemical equation.

37. 2g of ferrous sulphate crystals are heated in a dry boiling tube.

(i) List any two observations.

(ii) Name the type of chemical reaction taking place.

(iii) Write the chemical equation for the reaction.



38. Write chemical equation reactions taking place when carried out with the help of

- (a) Iron reacts with steam
- (b) Magnesium reacts with dil HCl
- (c) Copper is heated in air.

39. Which products will be obtained when lead nitrate is heated simply? Write balanced chemical equation for the reaction? State the type of chemical reaction that occur in the change.

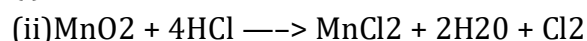
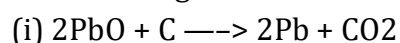
40. What is meant by skeletal type chemical equation? What does it represent?

Using the equation for electrolytic decomposition of water, differentiate between a skeletal chemical equation and a balanced chemical equation.

41. What is rancidity? Mention any two ways by which rancidity can be prevented.

42. Write balanced chemical equation for the reactions that take place during respiration. Identify the type of combination reaction that takes place during this process and justify the name. Give one more example of this type of reaction.

43. What is redox reaction? Identify the substance oxidised and the substance reduced in the following reactions.

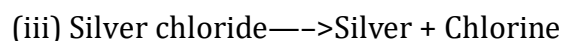
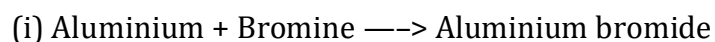


44. Write the balanced chemical equations for the following reaction and identify the type of reaction.

Thermite reaction, iron (III) oxide reacts with aluminium and gives molten iron and aluminium oxide.

45. A solution of potassium chloride when mixed with silver nitrate solution, an insoluble white substance is formed. Write the chemical reaction involved and also mention the type of the chemical reaction?

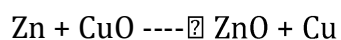
46. Write balanced equations for the following mentioning the type of reaction involved.



47. (a) Why is respiration considered as an exothermic reaction?

(b) Define the terms oxidation and reduction.

(c) Identify the substance that is oxidised and reduced in the following reaction



48. What is meant by

- (i) precipitation reaction,



- (ii) exothermic reaction,
- (iii) oxidation reaction?

Write balanced chemical equations for an example of each.

49. You might have noted that when copper powder is heated in a china dish, the surface of copper powder becomes coated with a black colour substance.

- (i) How has this black coloured substance formed?
- (ii) What is that black substance?
- (iii) Write the chemical equation of the reaction that takes place.

50. (a) What happens chemically when quicklime is added to water filled in a bucket?

(b) On what basis is a chemical equation balanced?

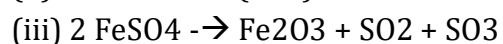
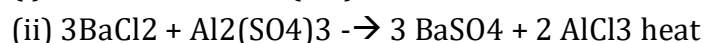
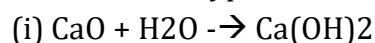
(c) What change in colour is observed when white silver chloride is left exposed to sunlight? State the type of chemical reaction in this change.

51. What happens when an aqueous solution of sodium sulphate reacts with an aqueous solution of barium chloride? State the physical conditions of reactants in which the reaction between them will not take place. Write the balanced chemical equation for the reaction and name the type of reaction.

52. When you have mixed the solutions of lead(II) nitrate and potassium iodide,

- (i) what was the colour of the precipitate formed and can you name the precipitate?
- (ii) Write the balanced chemical equation for this reaction.
- (iii) Is this also a double displacement reaction?

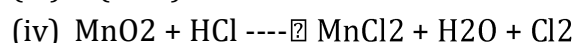
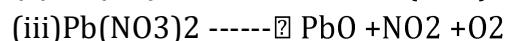
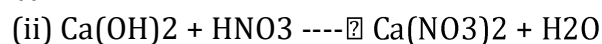
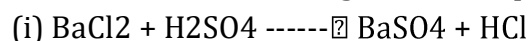
53. Name the type of reaction represented by the following equation:



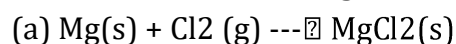
54. Write the chemical equation of the reaction in which the following changes have taken place with an example of each:

- (i) Change in colour
- (ii) Change in temperature
- (iii) Formation of precipitate

55. Balance the following chemical equations.



56. Balance the following chemical reactions and identify the type of reaction.





- (b) $\text{HgO(s)} \rightarrow \text{Hg(l)} + \text{O}_2\text{(g)}$
(c) $\text{Na(s)} + \text{S(s)} \rightarrow \text{Na}_2\text{S(s)}$
(d) $\text{TiCl}_4\text{(l)} + \text{Mg(s)} \rightarrow \text{Ti(s)} + \text{MgCl}_2\text{(s)}$
(e) $\text{CaO(s)} + \text{SiO}_2\text{(s)} \rightarrow \text{CaSiO}_3\text{(s)}$
(f) $\text{H}_2\text{O}_2\text{(l)} \rightarrow \text{H}_2\text{O(l)} + \text{O}_2\text{(g)}$

57. During the reaction of some metals with dilute hydrochloric acid, following observations were made.

- (a) Silver metal does not show any change
(b) The temperature of the reaction mixture rises when aluminium (Al) is added.
(c) The reaction of sodium metal is found to be highly explosive
(d) Some bubbles of a gas are seen when lead (Pb) is reacted with acid.

Explain these observations giving suitable reasons.

Long Answer Type Questions [5 Marks]

1. (a) Define a balanced chemical equation. Why should an equation be balanced?
(b) Write the balanced chemical equation for the following reaction:
(i) Phosphorus burns in presence of chlorine to form phosphorus pentachloride.
(ii) Burning of natural gas.
(iii) The process of respiration.
2. (a) Explain two ways by which food industries prevent rancidity.
(b) Discuss the importance of decomposition reaction in metal industry with three points.
3. (a) Write one example for each of decomposition reaction carried out with help of
(i) Electricity (ii) Heat (iii) Light
(b) Which of the following statements is correct and why copper can displace silver from silver nitrate and silver can displace copper from copper sulphate solution.
4. What happens when a piece of
(a) Zinc metal is added to copper sulphate solution?
(b) Aluminium metal is added to dilute hydrochloric acid?
(c) Silver metal is added to copper sulphate solution?
Also write the balanced chemical equation if the reaction occurs.
5. On heating blue coloured powder of copper (II) nitrate in a boiling tube, copper oxide (black), oxygen gas and a brown gas X is formed.
(a) Write a balanced chemical equation of the reaction
(b) Identify the brown gas X evolved.
(c) Identify the type of reaction



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- (d) What could be the pH range of aqueous solution of the gas x?
6. On adding a drop of barium chloride solution to an aqueous solution of sodium sulphate, white precipitate is obtained.
- (a) Write the balanced chemical equation of the reaction involved.
- (b) What other name can be given to this precipitation reaction?
- (c) On adding dilute hydrochloric acid to the reaction mixture, white precipitate disappears. Why?
7. You are provided with two containers made up of copper and aluminium. You are also provided with solutions of dilute HCl, dilute HNO₃, ZnCl₂ and H₂O. In which of the above con Chemical Reactions and Equations

Competency Based Questions

1. A compound 'X' used for drinking, has pH =7. Its acidified solution undergoes decomposition in presence of electricity to produce gases 'Y' and 'Z' The volume of Y is double than Z. Y is highly combustible whereas Z is supporter of combustion. Identify X. Y & Z and write the chemical reactions involved.
2. An aqueous solution of metal nitrate P reacts with sodium bromide solution to form yellow not of compound O which is used in photography. O on exposure to sunlight undergoes decomposition reaction to form metal present in P along with reddish brown gas. Identify P & O. Write the chemical reaction & type of chemical reaction.
3. Bhawana took a pale green substance A in a test tube, and heated it over the flame of a burner. A brown coloured residue B was formed along with evolution of two gases with burning smell of sulphur. Identify A & B. Write the chemical reaction involved.
4. A student took 2-3 g of a substance X in a glass beaker & poured water over it slowly. He observed bubbles along with hissing noise. The beaker becomes quite hot. Identify X. What type of reaction is it?
5. A substance X used for coating iron articles is added to a blue solution of a reddish brown metal Y. The colour of the solution gets discharged. Identify X and Y & also the type of reaction.
6. A reddish brown vessel developed a green coloured solid X when left open in air for a long time. When reacted with dil H₂SO₄. it forms a blue coloured solution along with brisk effervescence due to colourless & odourless gas Z. X decomposes to form black coloured oxide Y of a reddish brown metal along with gas Z. Identify X. Y. & Z.
7. A student has mixed the solutions of lead (II) nitrate and potassium iodide,

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- (i) What was the colour of the precipitate formed? Can you name the compound precipitated?
- (ii) Write the balanced chemical equation for this reaction,
- (iii) What type of reaction is it?
8. Observe the following activity & answer the Questions
- Do you observe anything happening around the zinc granules
 - Is there any change in its temperature?
 - Why is glass tube not dipped in dil H_2SO_4 ?
 - How is H_2 gas collected by downward displacement or upward displacement of water?
 - Is H_2 gas soluble or insoluble in water?
 - Is H_2 gas heavier or lighter than air?
9. A reddish brown metal X when heated in presence of oxygen forms a black compound Y which is basic in nature when heated with hydrogen gas gives back X. Identify X & Y. Write the chemical reaction between Y & H_2 . Identify the substance being oxidized & reduced
10. Name the type of reaction seen in the diagram below. Write the equation for the reaction.
11. A student burnt a metal A found in the form of ribbon. The ribbon burnt with a dazzling flame & a white powder B is formed which is basic in nature. Identify A & B. Write the balanced chemical equation.
12. A student dropped few pieces of marble in dilute HCl contained in a test tube. The gas evolved was passed through lime water. What change would be observed in lime water? Write chemical reactions for both the changes observed.
13. Astha has been collecting silver coins and Copper coins. One day she observed a black coating on silver coins and a green coating on Copper coins. Which chemical phenomenon is responsible for these coatings? Write the chemical name of black and green coatings
14. A student took 2-3 g of a substance X in a glass beaker & poured water over it slowly. He observed bubbles along with hissing noise. The beaker becomes quite hot. Identify X. What type of reaction is it?
15. A substance X used for coating iron articles is added to a blue solution of a reddish brown metal. The colour of the solution gets discharged Identify X and Y & also the type of reaction.
16. A solution of a substance 'X' is used for white washing
- Name the substance 'X' and writes its formula.
 - Write the reaction of the substance 'X' named in (i) above with water
17. A shiny brown coloured element 'X' on heating in air becomes black in colour. Name the



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element 'X' and the black coloured compound formed.

18. An aqueous solution of metal nitrate P reacts with sodium bromide solution to form yellow ppt of compound Q which is used in photography. Q on exposure to sunlight undergoes decomposition reaction to form metal present in P along with reddish brown gas.

Identify P & Q. Write the chemical reaction & type of chemical reaction.

19. A reddish brown vessel developed a green coloured solid X When left open in air for a long time. When reacted with dil, it forms a blue coloured solution along with brisk effervescence due to colourless & odourless gas Z. X decomposes to form black coloured oxide Y of a reddish brown metal along with gas Z, Identify X, Y, & Z.