

# ABs Paths, Kolhapur

## Chemical Equations and Reactions

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### I. Multiple Choice Questions

- Which of the following does not involve a chemical change?
  - Leaving milk at room temperature during summer
  - Leaving an iron nail left exposed to humid atmosphere
  - Respiration
  - Evaporation of water
- Which of the following observation/s can be used to determine whether a chemical reaction has taken place?
  - Change in colour
  - Change in temperature
  - Evolution of a gas
  - Any one of the three
- Which of the following does not represent the balanced chemical reaction correctly?
  - $\text{Zn (s)} + \text{H}_2\text{O (l)} \rightarrow \text{NaOH (aq)} + \text{H (g)}$
  - $\text{BaCl}_2 \text{ (aq)} + \text{Na}_2\text{SO}_4 \text{ (aq)} \rightarrow \text{BaSO}_4 \text{ (s)} + 2 \text{ NaCl (aq)}$
  - $\text{H}_2 \text{ (g)} + \text{Cl}_2 \text{ (g)} \rightarrow 2 \text{ HCl (g)}$
  - $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)}$
- On white washing the walls of a room, after drying, they give shining white look. This is due to the formation of
  - $\text{CaCl}_2$
  - $\text{Ca(OH)}_2$
  - $\text{CaCO}_3$
  - $\text{CaO}$
- Which of the following is not a combination reaction?
  - $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)}$
  - $\text{C (s)} + \text{O}_2 \text{ (g)} \rightarrow \text{CO}_2 \text{ (g)}$
  - $\text{CH}_4 \text{ (g)} + 2 \text{ O}_2 \text{ (g)} \rightarrow \text{CO}_2 \text{ (g)} + 2 \text{ H}_2\text{O (g)}$
  - $2 \text{ H}_2 \text{ (g)} + \text{O}_2 \text{ (g)} \rightarrow 2 \text{ H}_2\text{O (l)}$

6. The reactions in which heat is evolved are called
  - (a) Thermal reactions
  - (b) Exothermic reactions
  - (c) Endothermic reactions
  - (d) Photochemical reactions
  
7. Which of the following reaction is an endothermic reaction?
  - (a) Burning of coal
  - (b) Decomposition of vegetable matter into compost
  - (c) Process of respiration
  - (d) Decomposition of calcium carbonate to form quick lime and carbon dioxide
  
8. When crystals of ferrous sulphate are heated, they decompose to form
  - (a)  $\text{FeO (s)}$  and  $\text{SO}_2 \text{ (g)}$
  - (b)  $\text{FeO (s)}$  and  $\text{SO}_3 \text{ (g)}$
  - (c)  $\text{Fe}_2\text{O}_3 \text{ (s)}$ ,  $\text{SO}_2 \text{ (g)}$ , and  $\text{SO}_3 \text{ (g)}$
  - (d)  $\text{Fe}_2\text{O}_3 \text{ (s)}$ ,  $\text{SO}_2 \text{ (g)}$ , and  $\text{SO}_3 \text{ (g)}$
  
9. When crystals of lead nitrate are heated, they decompose to form
  - (a)  $\text{Pb (s)}$  and  $\text{NO}_2 \text{ (g)}$
  - (b)  $\text{PbO (s)}$ ,  $\text{NO}_2 \text{ (g)}$ , and  $\text{O}_2 \text{ (g)}$
  - (c)  $\text{Pb (s)}$ ,  $\text{NO}_2 \text{ (g)}$ , and  $\text{O}_2 \text{ (g)}$
  - (d)  $\text{PbO (s)}$ ,  $\text{NO (g)}$ , and  $\text{NO}_2 \text{ (g)}$
  
10. Which of the following is not a necessary condition for a decomposition reaction?
  - (a) There is only one reactant
  - (b) There are two or more than two products
  - (c) Heating is always required
  - (d) All the above conditions are necessary
  
11. Which of the following is not a thermal decomposition reaction?
  - (a)  $\text{CaCO}_3 \text{ (s)} \rightarrow \text{CaO (s)} + \text{CO}_2 \text{ (g)}$
  - (b)  $2 \text{ AgCl (s)} \rightarrow 2 \text{ Ag (s)} + \text{Cl}_2 \text{ (g)}$
  - (c)  $2 \text{ KClO}_3 \text{ (s)} \rightarrow 2 \text{ KCl (s)} + 3 \text{ O}_2 \text{ (g)}$
  - (d)  $2 \text{ NaHCO}_3 \text{ (s)} \rightarrow \text{Na}_2\text{CO}_3 \text{ (s)} + \text{CO}_2 \text{ (g)} + \text{H}_2\text{O (l)}$
  
12. The following examples of decomposition reactions:
 
$$2 \text{ AgBr (s)} \rightarrow 2 \text{ Ag (s)} + \text{Br}_2 \text{ (g)}$$

$$2 \text{ H}_2\text{O (l)} \rightarrow 2 \text{ H}_2 \text{ (g)} + \text{O}_2 \text{ (g)}$$
 represent respectively:
  - (a) Thermal decomposition, electrolytic decomposition
  - (b) Thermal decomposition, thermal decomposition
  - (c) Photodecomposition, electrolytic decomposition

- (d) Photodecomposition, thermal decomposition
13. On electrolytic decomposition of water, the ratio of  $\text{H}_2$  and  $\text{O}_2$  gases collected is
- (a) 1 : 1
  - (b) 1 : 2
  - (c) 2 : 1
  - (d) Depends on amount of  $\text{H}_2\text{O}$  taken
14. Which of the following displacement reaction will not take place?
- (a)  $\text{Cu (s)} + \text{FeSO}_4 \text{ (aq)} \rightarrow \text{CuSO}_4 \text{ (aq)} + \text{Fe (s)}$
  - (b)  $\text{Zn (s)} + \text{FeSO}_4 \text{ (aq)} \rightarrow \text{ZnSO}_4 \text{ (aq)} + \text{Fe (s)}$
  - (c)  $\text{Cu (s)} + 2 \text{AgNO}_3 \text{ (aq)} \rightarrow \text{Cu(NO}_3)_2 \text{ (aq)} + 2 \text{Ag (s)}$
  - (d)  $\text{Fe (s)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{FeSO}_4 \text{ (aq)} + \text{Cu (s)}$
15. Which one of the following is an example of a double decomposition reaction as well as precipitation reaction?
- (a)  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
  - (b)  $\text{FeS} + \text{H}_2\text{SO}_4 \rightarrow \text{FeSO}_4 + \text{H}_2\text{S}$
  - (c)  $\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2 \text{NaCl}$
  - (d)  $2 \text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2 \text{H}_2\text{O}$
16. Calcium oxide reacts vigorously with water to produce slaked lime  
 $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)}$   
This reaction can be classified as
- (A) Combination reaction
  - (B) Exothermic reaction
  - (C) Endothermic reaction
  - (D) Oxidation reaction
17. When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained. The reaction is an example of
- (a) Combination reaction
  - (b) Displacement reaction
  - (c) Decomposition reaction
  - (d) Double displacement reaction
18. In a double displacement reaction such as between sodium sulphate and barium chloride solution:
- (A) Exchange of atoms takes place
  - (B) Exchange of ions takes place
  - (C) A precipitate is produced
  - (D) An insoluble salt is produced

19. Which one of the following statements is not correct?
- (a) Oxidation involves gain of oxygen or loss of hydrogen
  - (b) Reduction involves loss of oxygen or gain of hydrogen
  - (c) Oxidizing agent is a substance which can lose hydrogen
  - (d) Reducing agent is a substance which can gain oxygen
20. The chemical formula of rust is
- (a)  $\text{FeO} \cdot \text{Fe}_2\text{O}_3$
  - (b)  $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$
  - (c)  $\text{FeO} \cdot \text{H}_2\text{O}$
  - (d) Any one of these
21. Rancidity involves
- (a) Oxidation of food
  - (b) Reduction of food
  - (c) Oxidation or reduction of food
  - (d) Fermentation of food
22. Which of the following reaction will take place?
- (a) Ag in  $\text{CuSO}_4$  solution
  - (b) Cu in  $\text{FeSO}_4$  solution
  - (c) Fe in  $\text{Al}_2(\text{SO}_4)_3$  solution
  - (d) Fe in  $\text{CuSO}_4$  solution
23. For the reaction chosen above, what will be the colour of the solution?
- (a) Blue
  - (b) Light green
  - (c) Colourless
  - (d) Pale yellow
24. On the basis of your study, what is the correct order of activity of metals?
- (a)  $\text{Ag} > \text{Cu} > \text{Fe} > \text{Al}$
  - (b)  $\text{Al} > \text{Fe} > \text{Cu} > \text{Ag}$
  - (c)  $\text{Al} > \text{Cu} > \text{Fe} > \text{Ag}$
  - (d)  $\text{Cu} > \text{Fe} > \text{Al} > \text{Ag}$
25. When copper strip is dipped in silver nitrate solution which of the following is/are correct?
- (i) Colour of silver nitrate solution turns blue
  - (ii) It is a redox reaction
  - (iii) It is a double displacement reaction
  - (iv) No reaction will take place
26. Which of the following represents a balanced chemical equation correctly?
- (a)  $\text{Mg}_3\text{N}_2 + 6 \text{H}_2\text{O} \rightarrow 3 \text{Mg}(\text{OH})_2 + \text{N}_2 + 3 \text{H}_2$

- (b)  $\text{Na}_2\text{CO}_3 + 2 \text{HCl} \rightarrow \text{Na}_2\text{Cl}_2 + \text{H}_2\text{O} + \text{CO}_2$   
(c)  $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{ZnSO}_4 + 2 \text{H}$   
(d)  $2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$

27. When steam is passed over heated iron, the products formed are magnetic oxide of iron and hydrogen gas. The coefficients of Fe and  $\text{H}_2\text{O}$  in the balanced equation are respectively:

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

28. Which of the following represents an endothermic reaction?

- (a)  $\text{N}_2 + \text{O}_2 \rightarrow 2 \text{NO}$   
(b) Respiration  
(c) Burning of coke  
(d)  $\text{N}_2 + 3 \text{H}_2 \rightarrow 2 \text{NH}_3$

29. In the preparation of  $\text{O}_2$  gas by heating potassium chlorate ( $\text{KClO}_3$ ), the catalyst used is

- (a)  $\text{Fe}_2\text{O}_3$   
(b)  $\text{MnO}_2$   
(c) Ni  
(d) Fe

30. Which of the following statement/s is/are correct?

- (i) When  $\text{CO}_2$  is passed through lime water, it first turns milky and then becomes colourless  
(ii) There is no action of water on magnesium nitride ( $\text{Mg}_3\text{N}_2$ )  
(iii) When  $\text{Cl}_2$  is passed through KBr solution, the solution acquires light brown colour  
(iv) When dilute sulphuric acid is poured over FeS crystals, a pungent smelling gas is produced  
(a) (i), (ii), (iii)  
(b) (i), (iii), (iv)  
(c) (ii), (iii), (iv)  
(d) (i), (ii), (iii), (iv)

31. When  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  crystals are strongly heated, the end products are:

- (a)  $\text{CuSO}_4$  and  $\text{H}_2\text{O}$   
(b) CuO,  $\text{SO}_2$   
(c) CuO,  $\text{SO}_2$ ,  $\text{O}_2$   
(d) CuO,  $\text{SO}_2$ ,  $\text{SO}_3$  and  $\text{O}_2$

32. Which of the following is not a photodecomposition reaction?

- (a)  $\text{NaCl} \rightarrow 2 \text{Na} + \text{Cl}_2$

- (b)  $2 \text{AgBr} \rightarrow 2 \text{Ag} + \text{Br}_2$
- (c)  $2 \text{HI} \rightarrow \text{H}_2 + \text{I}_2$
- (d)  $2 \text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} + \text{O}_2$

33. Which of the following is a double displacement reaction but not a precipitation reaction?

- (a)  $2 \text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2 \text{H}_2\text{O}$
- (b)  $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$
- (c)  $\text{BaCl}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2 \text{HCl}$
- (d)  $\text{Pb} + \text{CuCl}_2 \rightarrow \text{PbCl}_2 + \text{Cu}$

34. Oxidation reaction involves

- (a) Gain of oxygen
- (b) Loss of hydrogen
- (c) Loss of electrons
- (d) Any one of these

35. Which of the following are combination reactions?

- (i)  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- (ii)  $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$
- (iii)  $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$
- (iv)  $2 \text{NO} + \text{O}_2 \rightarrow 2 \text{NO}_2$
- (a) (i) and (ii)
- (b) (ii) and (iii)
- (c) (ii) and (iv)
- (d) (ii), (iii) and (iv)

36. In the reaction  $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$ , the substance that acts as an oxidizing agent is

- (a) CuO
- (b)  $\text{H}_2$
- (c) Cu
- (d)  $\text{H}_2\text{O}$

37. In the reaction  $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$ , the substance that acts as a reducing agent is

- (a) ZnO
- (b) C
- (c) Zn
- (d) CO

38. In the reaction  $2 \text{H}_2\text{S} + \text{SO}_2 \rightarrow 3 \text{S} + 2 \text{H}_2\text{O}$ , the substance oxidized and reduced respectively are

- (a)  $\text{H}_2\text{S}$  and  $\text{SO}_2$
- (b)  $\text{SO}_2$  and  $\text{H}_2\text{S}$
- (c)  $\text{SO}_2$  and S

(d)  $\text{H}_2\text{S}$  and S

39. In the reaction  $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$ , the substance oxidized and reduced are respectively

- (a) Zn and Cu
- (b) Cu and Zn
- (c) Zn,  $\text{Cu}^{2+}$
- (d)  $\text{Cu}^{2+}$ , Zn

40. Which of the following statement/s correctly represents an oxidizing agent?

- (i) A substance that gains oxygen acts as an oxidizing agent
  - (ii) A substance which undergoes reduction acts as an oxidizing agent
  - (iii) A substance that loses hydrogen acts as an oxidizing agent
  - (iv) A substance that gains electrons in a reaction acts as an oxidizing agent
- (a) (i) and (ii)
  - (b) (ii) and (iii)
  - (c) (ii) and (iv)
  - (d) (i) and (iv)

41. A student while burning a magnesium ribbon in air, collected the products in a wet watch glass. The new product obtained was:

- (a) Magnesium oxide
- (b) Magnesium carbonate
- (c) Magnesium hydroxide
- (d) Magnesium chloride

42. When lead nitrate powder is heated in a boiling tube, we observe:

- (a) Brown fumes of nitrogen dioxide
- (b) Brown fumes of lead oxide
- (c) Yellow fumes of nitrogen dioxide
- (d) Brown fumes of nitric oxide

43. A student took sodium sulphate solution in a test tube and added barium chloride solution to it. He observed that an insoluble substance has formed. The colour and molecular formula of the insoluble substance is:

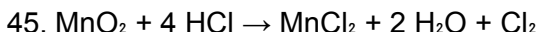
- (a) Grey,  $\text{Ba}_2\text{SO}_4$
- (b) Yellow,  $\text{Ba}(\text{SO}_4)_2$
- (c) White,  $\text{BaSO}_4$
- (d) Pink,  $\text{BaSO}_4$

44.  $\text{C}_6\text{H}_{12}\text{O}_6 (\text{aq}) + 6 \text{O}_2 (\text{aq}) \rightarrow 6 \text{CO}_2 (\text{aq}) + 6 \text{H}_2\text{O} (\text{l})$

The above reaction is a/an:

- (a) Displacement reaction
- (b) Endothermic reaction

- (c) Exothermic reaction
- (d) Neutralisation reaction



Which of the following are correct?

- (i) HCl is oxidized to  $\text{Cl}_2$
  - (ii)  $\text{MnO}_2$  is reduced to  $\text{MnCl}_2$
  - (iii)  $\text{MnCl}_2$  acts as an oxidizing agent
  - (iv) HCl acts as an oxidizing agent
- (a) (ii), (iii) and (iv)
  - (b) (i), (ii) and (iii)
  - (c) (i) and (ii) only
  - (d) (iii) and (iv) only

46. Why is it important to balance a chemical equation to satisfy the law of conservation of mass? Which of the following is **incorrect**?

- (a) Total mass of elements in reactants = total mass in products
- (b) Number of atoms of each element is the same before and after
- (c) Chemical composition remains the same before and after
- (d) Mass can neither be created nor destroyed in a chemical reaction

47. Which of the following reactions is categorised as thermal decomposition reaction?

- (a)  $2 \text{H}_2\text{O} (\text{l}) \rightarrow 2 \text{H}_2 (\text{g}) + \text{O}_2 (\text{g})$
- (b)  $2 \text{AgBr} (\text{s}) \rightarrow 2 \text{Ag} (\text{s}) + \text{Br}_2 (\text{g})$
- (c)  $2 \text{AgCl} (\text{s}) \rightarrow 2 \text{Ag} (\text{s}) + \text{Cl}_2 (\text{g})$
- (d)  $\text{CaCO}_3 (\text{s}) \rightarrow \text{CaO} (\text{s}) + \text{CO}_2 (\text{g})$

48. Reena took 5 ml of lead nitrate solution and added 4 ml of potassium iodide. What did she observe?

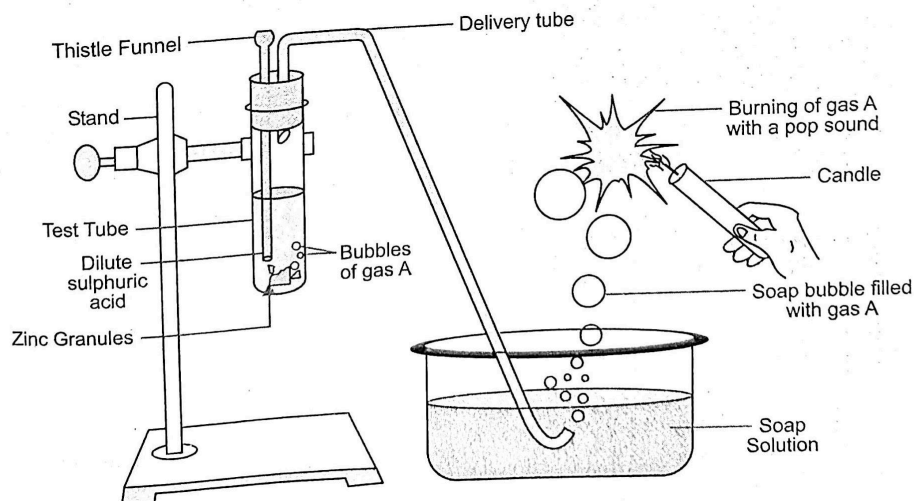
- (a) Solution turned red
- (b) Yellow precipitate was formed
- (c) White precipitate was formed
- (d) Mixture became hot

49. Identify gas A in the following experiment:

(Zinc granules + Dilute  $\text{H}_2\text{SO}_4 \rightarrow$  bubbles collected in soap solution  $\rightarrow$  pop sound when lit)

- (a) Nitrogen
- (b) Hydrogen
- (c) Oxygen
- (d) Carbon dioxide

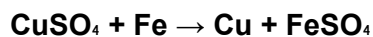




50. Which of the following correctly represents a balanced chemical equation?

- (a)  $\text{Fe (s)} + 4 \text{H}_2\text{O (g)} \rightarrow \text{Fe}_3\text{O}_4 \text{(s)} + 4 \text{H}_2 \text{(g)}$
- (b)  $3 \text{Fe (s)} + 4 \text{H}_2\text{O (g)} \rightarrow \text{Fe}_3\text{O}_4 \text{(s)} + 4 \text{H}_2 \text{(g)}$
- (c)  $3 \text{Fe (s)} + \text{H}_2\text{O (g)} \rightarrow \text{Fe}_3\text{O}_4 \text{(s)} + \text{H}_2 \text{(g)}$
- (d)  $3 \text{Fe (s)} + 4 \text{H}_2\text{O (g)} \rightarrow \text{Fe}_3\text{O}_4 \text{(s)} + \text{H}_2 \text{(g)}$

51. In the reaction of iron with copper sulphate solution:



Which option in the table correctly represents the **substance oxidised** and the **reducing agent**?

Option	Substance Oxidized	Reducing Agent
(a)	Fe	Fe
(b)	Fe	FeSO <sub>4</sub>
(c)	Cu	Cu
(d)	CuSO <sub>4</sub>	Fe

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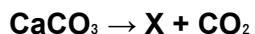
52. The chemical reaction between copper and oxygen can be categorised as:

- (a) Displacement reaction
  - (b) Decomposition reaction
  - (c) Combination reaction
  - (d) Double displacement reaction
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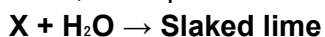
53. Why is it important to balance a skeletal chemical equation?

- (a) To verify law of conservation of energy
  - (b) To verify the law of constant proportion
  - (c) To verify the law of conservation of mass
  - (d) To verify the law of conservation of matter
- 

54. Limestone is heated in Step 1:



Then, in Step 2:



Choose the correct option:

Option	Step 1	Step 2
(a)	Endothermic	Exothermic
(b)	Exothermic	Endothermic
(c)	Exothermic	Exothermic
(d)	Endothermic	Endothermic

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55. Calcium oxide can be reduced to calcium by heating with sodium metal.

Which compound would act as an oxidizing agent?

- (a) Sodium
  - (b) Sodium oxide
  - (c) Calcium
  - (d) Calcium oxide
- 

56. In the redox reaction:

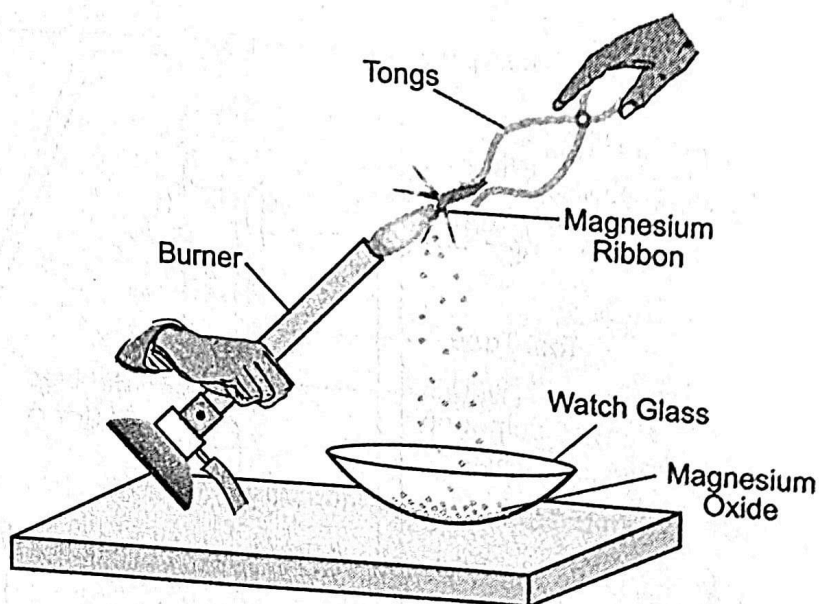


Which of the following is correct?

- (a)  $\text{MnO}_2$  is reduced to  $\text{MnCl}_2$  and  $\text{HCl}$  is oxidized to  $\text{H}_2\text{O}$
  - (b)  $\text{MnO}_2$  is reduced to  $\text{MnCl}_2$  and  $\text{HCl}$  is oxidized to  $\text{Cl}_2$
  - (c)  $\text{MnO}_2$  is oxidized to  $\text{MnCl}_2$  and  $\text{HCl}$  is reduced to  $\text{Cl}_2$
  - (d)  $\text{MnO}_2$  is oxidized to  $\text{MnCl}_2$  and  $\text{HCl}$  is reduced to  $\text{H}_2\text{O}$
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57. Which of the following is the correct observation for this setup (magnesium ribbon burned with tongs, white solid collected in a watch glass)?

- (a) Brown powder of magnesium oxide is formed
- (b) Colourless gas which turns lime water milky is evolved
- (c) Magnesium ribbon burns with brilliant white light
- (d) Reddish brown gas with a smell of burning sulphur is



### III. Assertion-Reason Type Questions (58 to 72)

**Instructions:** For each of the following questions, choose the correct option:

- (a) Both A and R are true, and R is the correct explanation of A
  - (b) Both A and R are true, but R is not the correct explanation of A
  - (c) A is true, R is false
  - (d) A is false, R is true
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58.

**Assertion (A):** Ferrous sulphate crystals are green in colour but on heating, they first turn white and on further heating decompose to leave behind a reddish brown residue.

**Reason (R):** They turn white due to loss of water of crystallisation and the reddish brown residue is due to formation of  $\text{Fe}_2\text{O}_3$ .

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59.

**Assertion (A):** When copper powder is heated in air, it turns black.

**Reason (R):** Copper reacts with  $\text{H}_2\text{S}$  gas of the air forming black  $\text{CuS}$ .

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60.

**Assertion (A):** Iron gets corroded in moist air but silver is not.

**Reason (R):** Iron is more active metal than silver.

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61.

**Assertion (A):** After whitewashing the walls, a shiny white finish is obtained after 2 to 3 days.

**Reason (R):** Calcium oxide reacts with carbon dioxide to form calcium hydrogen carbonate which gives shiny white finish. (CBSE 2022)

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62.

**Assertion (A):** Silver salts are used in black and white photography.

**Reason (R):** Silver salts do not decompose in the presence of light. (CBSE 2022)

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63.

**Assertion (A):** Burning of natural gas is an endothermic reaction.

**Reason (R):** Methane gas combines with oxygen to produce carbon dioxide and water. (CBSE Sample Paper 2021–22)

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64.

**Assertion (A):** Decomposition of vegetable matter into compost is an endothermic reaction.

**Reason (R):** Decomposition reaction involves breakdown of a single reactant into simpler products.

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65.

**Assertion (A):** In a reaction, the substance which is oxidized is called oxidizing agent.

**Reason (R):** Oxidizing agent is a substance which takes up hydrogen in a chemical reaction.

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66.

**Assertion (A):** When 1 g of graphite or 1 g of diamond is burnt in excess air, the heat evolved is the same.

**Reason (R):** Both graphite and diamond are allotropic forms of carbon.

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67.

**Assertion (A):** When  $\text{CO}_2$  gas is passed through lime water for a long time, the solution first turns milky and then becomes colourless.

**Reason (R):** Lime water first changes into calcium carbonate which then changes into calcium bicarbonate.

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68.

**Assertion (A):** If a silver spoon is kept immersed in blue coloured copper nitrate solution, the blue colour disappears or fades after some time.

**Reason (R):**  $\text{AgNO}_3$  solution is colourless.

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69.

**Assertion (A):** When  $\text{Cl}_2$  is passed through colourless KI solution, the solution acquires a violet colour.

**Reason (R):** Chlorine is more reactive than iodine.

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70.

**Assertion (A):** Reaction between Na and  $\text{Cl}_2$  to form NaCl is not a redox reaction.

**Reason (R):** A redox reaction must involve loss or gain of oxygen or hydrogen or electrons.

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71.

**Assertion (A):** Silver vessels or ornaments lose their shine after some time.

**Reason (R):** Oxygen and moisture of the air attack silver to form a layer of silver oxide ( $\text{Ag}_2\text{O}$ ) on its surface.

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72.

**Assertion (A):** Silver bromide decomposition is used in black and white photography.

**Reason (R):** Light provides energy for this exothermic reaction. (CBSE Sample Paper 2022–23)

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Question No.	Correct Option
1	d
2	d
3	a
4	c
5	c
6	b
7	d
8	c
9	b
10	c
11	b
12	c
13	c
14	a
15	c
16	c
17	d
18	d
19	c
20	b

21	a
22	d
23	b
24	b
25	a
26	d
27	b
28	a
29	b
30	d
31	d
32	a
33	a
34	d
35	c
36	a
37	b
38	a
39	a
40	a
41	c
42	a
43	c
44	c
45	c
46	c
47	d
48	b
49	b
50	b
51	a
52	c
53	c
54	a
55	d
56	b
57	c
58	a
59	d
60	a
61	c
62	d
63	d
64	c
65	c
66	a
67	a

68	b
69	a
70	d
71	d
72	c