WORKSHEET

Class X

Chapter: Chemical Reactions and Equations

1. Which of the following is not a physical change?
   (a) Boiling of water to give water vapor
   (b) Melting of ice to give water
   (c) Dissolution of salt in water
   (d) Combustion of Liquefied Petroleum Gas (LPG)
2. Which of the following statements about the given reaction is not correct?
   $3Fe(s) + 4H_2O(g) \rightarrow Fe_3O_4(s) + 4H_2(g)$
   (a) Iron metal is getting oxidized
   (b) Water is getting reduced
   (c) Water is acting as a reducing agent
   (d) Water is acting as an oxidizing agent
3. Which of the statements about the reaction below are incorrect?
   $2PbO(s) + C(s) \rightarrow 2Pb(s) + CO_2(g)$
   (a) Lead is being reduced.
   (b) Carbon dioxide is being oxidised.
   (c) Carbon is being oxidised.
   (d) Lead oxide is being reduced.
      i. (a) and (b)
      ii. (a) and (c)
      iii. (a), (b), and (c)
      iv. All
4. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$
   The above reaction is an example of a
   (a) combination reaction.
   (b) double displacement reaction.
   (c) decomposition reaction.
   (d) displacement reaction.
5. What happens when dilute hydrochloric acid is added to iron fillings? Select the correct answer.
   (a) Hydrogen gas and iron chloride are produced.
   (b) Chlorine gas and iron hydroxide are produced.
   (c) No reaction takes place.
   (d) Iron salt and water are produced.
6. Which of the following is exothermic processes?
   (a) Dissolution of ammonium nitrate
   (b) Dilution of an acid
   (c) Evaporation of water
   (d) Sublimation of camphor
7. Three beakers labelled as A, B, and C each containing 25 mL of water were taken. A small amount of NaOH, anhydrous CuSO4, and NaCl were added to the beakers A, B, and C respectively. It was observed that there was an increase in the temperature of the solutions contained in beakers A and B, whereas in the case of beaker C, the temperature of the solution falls. Which one of the following statement(s) is(are) correct?
   i. In beakers A and B, an exothermic process has occurred.
   ii. In beakers A and B, an endothermic process has occurred.
   iii. In beaker C, an exothermic process has occurred.
   iv. In beaker C, an endothermic process has occurred.

8. Solid calcium oxide reacts vigorously with water to form calcium hydroxide accompanied by liberation of heat. This process is called slaking of lime. Calcium hydroxide dissolves in water to form its solution called lime water. Which among the following is(are) true about slaking of lime and the solution formed?
    i. It is an endothermic reaction
    ii. It is an exothermic reaction
    iii. The pH of the resulting solution will be more than seven
    iv. The pH of the resulting solution will be less than seven
9. Write the balanced chemical equations for the following reactions and identify the type of reaction in each case.
    A. Nitrogen gas is treated with hydrogen gas in the presence of a catalyst at 773K to form ammonia gas.
    B. Hydrogen sulphide gas burns in air to give water and sulphur dioxide.
    C. Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate.
    D. Ethane is burnt in the presence of oxygen to form carbon dioxide, water, and releases heat and light.
    E. Potassium metal reacts with water to give potassium hydroxide and hydrogen gas.
10. Write the balanced chemical equations for the following reactions and identify the type of reaction in each case.
    A. Thermite reaction, iron (III) oxide reacts with aluminium and gives molten iron and aluminium oxide.
    B. Magnesium ribbon is burnt in an atmosphere of nitrogen gas to form solid magnesium nitride.
    C. Chlorine gas is passed into an aqueous potassium iodide solution to form potassium chloride solution and solid iodine.
    D. Ethanol is burnt in air to form carbon dioxide, water, and releases heat.
11. Balance the following chemical equations:
    A. $HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + H_2O$
    B. $NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2$
    C. $NaCl + AgNO_3 \rightarrow AgCl + NaNO_3$
    D. $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + HCl$
12. Which among the following are physical or chemical changes?
    (a) Evaporation of petrol
    (b) Burning of Liquefied Petroleum Gas (LPG)
    (c) Heating of an iron rod to red hot.
    (d) Curdling of milk
    (e) Sublimation of solid ammonium chloride
13. A substance X, which is an oxide of a group 2 element, is used intensively in the cement industry. This element is present in bones also. On treatment with water, it forms a solution which turns red litmus blue. Identify X and also write the chemical reactions involved.
14. How do decomposition reactions differ from combination reactions? Provide equations for both types of reactions to illustrate their differences.
15. How is silver recovered from a silver nitrate solution during the refining process, and what role does copper metal play in this process? Provide the chemical equation representing the reaction involved.
16. Zinc liberates hydrogen gas when reacted with dilute hydrochloric acid, whereas copper does not. Explain why?
17. Why do silver articles turn black when exposed to air for a few days, and how does toothpaste help restore their shine? Name the phenomenon involved in the blackening of silver articles and provide the chemical formula of the black substance formed.
18. Provide examples of decomposition reactions for carbonates, sulphates, and nitrates. Write balanced chemical equations for each of these decomposition reactions, and identify the products formed in each case