# S.3 CHEMISTRY ASSESSMENT TEST

TIME: 90 MINUTES TOPIC: CHLORINE AND ITS COMPOUNDS

INSTRUCTIONS: Attempt all questions

## SECTION A

## PART I

1. Which one of the following statements is true about chlorine?
   A. It displaces fluorine from solution of its salts
   B. It is reducing agent
   C. It is less dense than air
   D. It forms a precipitate with lead(II) nitrate solution
2. Which one of the following is a use of chlorine?
   A. Sewage treatment C. Food preservation
   B. Manufacture of plastics D. Manufacture of fertilisers
3. Which one of the following procedures is used to confirm the presence of chloride ions in a solution?
   A. Addition of lead(II) nitrate solution followed by nitric acid
   B. Addition of barium nitrate solution followed by nitric acid
   C. Addition of silver nitrate solution followed by nitric acid and then ammonia solution
   D. Addition of iron(II) sulphate followed by concentrated sulphuric acid.
4. Which one of the following substances will form white fumes with hydrogen chloride?
   A. Concentrated sodium hydroxide solution C. Concentrated sulphuric acid
   B. Concentrated nitric acid D. Concentrated ammonia solution
5. Which one of the following substances is the bleaching agent in chlorine water?
   A. *HOCl* B. *HCl* C. $Cl_2$ *D.* $HClO_3$
6. Which one of the following is not a property of hydrogen chloride?
   A. It forms a white precipitate with silver nitrate
   B. It turns moist blue litmus paper red
   C. It forms white fumes with ammonia gas
   D. It bleaches coloured flowers
7. Which one of the following substances is not formed when chlorine is bubbled through cold dilute sodium hydroxide solution?
   A. Sodium chlorate C. Sodium hypochlorate
   B. Sodium chloride D. Water
8. Which one of the following substances are components of chlorine water?
   A. Chlorine and water C. Hydrochloric acid and hypochlorous acid
   B. Hydrochloric acid and chlorine D. Hypochlorous acid and water.
9. Which one of the following pairs of substances will not react to produce chlorine?
   A. Potassium manganite (VII) and concentrated hydrochloric acid
   B. Hydrogen chloride and potassium manganite (VII) solution
   C. Sodium chloride and concentrated sulphuric acid
   D. Manganate (IV) oxide and concentrated hydrochloric acid

10. The suitable method of preparing anhydrous iron (II) chloride is by
    A. passing dry chlorine over heated iron
    B. reacting iron(II) oxide with dilute hydrochloric acid
    C. passing dry hydrogen chloride gas over heated iron
    D. reacting iron with dilute hydrochloric acid

11. Which one of the following is observed when chlorine is exposed to sunlight?
    A. A colourless gas is evolved which relights a glowing split
    B. The solution turns from green to yellow
    C. A gas which bleaches litmus is evolved
    D. A colourless gas which burns with a pale blue flame is evolved

## PART II

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|---|---|---|---|
| 12. | A solution of chlorine in water turns blue litmus paper red | **Because** | Chlorine is a bleaching agent. |
| 13. | When a piece of phosphorous is lowered into a jar of chlorine, white fumes are observed. | **Because** | Hydrogen chloride is formed during the reactions |
| 14. | Iodine is formed when chlorine gas is bubbled into a solution of potassium iodide. | **Because** | Chlorine gas reduces the iodide ions into the solution. |
| 15. | Chlorine is used to prepare anhydrous iron(II) chloride. | **Because** | Chlorine is an oxidizing agent |

## PART III

16. When chlorine gas is dissolved in hot cncentrated potassium hydroxide solution, it produces
    1. potassium chlorate(V)
    2. potassium hydrogen chloride
    3. potassium chloride
    4. potassium chlorate(IV)

17. Which of the following salts can be prepared by passing dry hydrogen chloride over the heated metal?
    1. $CuCl_2$ 2. $ZnCl_2$ 3. $FeCl_3$ 4. $MgCl_2$

18. Which of the following equations show reaction(s) in which hydrogen chloride is behaving as an acid?
    1. $HCl_{(g)} + AgNO_{(aq)} \longrightarrow AgCl_{(s)} + HNO_{3(aq)}$
    2. $2HCl_{(g)} + Fe_{(s)} \longrightarrow FeCl_{2(s)} + H_{2(g)}$
    3. $2HCl_{(g)}\ Pb(NO_3)_{2(aq)} \longrightarrow PbCl_{2(s)} + 2HNO_{3(aq)}$
    4. $HCl_{(g)} + NH_{3(g)} \longrightarrow NH_4Cl_{(s)}$

19. Which of the following is/are property(ies) of aqueous hydrogen chloride?
    1. it reacts with copper to form hydrogen
    2. it reacts with carbonates to form carbon dioxide
    3. it bleaches litmus paper

4. it reacts with calcium oxide to form a salt and water

20. When chlorine is dissolved in cold aqueous solution of sodium hydroxide, it produces
    1. sodium chlorate(V)
    2. sodium chloride
    3. sodium hydrogen chloride
    4. sodium chlorate(IV)

## SECTION B

21. (a) Hydrogen chloride can be produced from potassium chloride.
    (i) Name another reagent that is used with potassium chloride to produce hydrogen chloride. ***(½ mark)***

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    (ii) Write an equation for the reaction leading to the formation of hydrogen chloride. ***(1½marks)***

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    (b) Write an equation for the reaction between hydrogen chloride and
    (i) Silver nitrate solution. ***(1½ marks)***

……

    (ii) iron in the presence of water. ***(1½ marks)***

……

22. State what would be observed and write ionic equation for the reaction that would take place if hydrogen chloride was bubbled through aqueous
    (a) sodium hydrogen carbonate
    (i) Observation ***(½ mark)***

……

    (ii) Equation. ***(1½ mark)***

……

    (b) Silver nitrate.
    (i) Observation. ***(½ mark)***

……

    (ii) Equation. ***(1½ marks)***

……

23. (a) State what would be observed if chlorine was bubbled through
    ***(i)*** water. ***(½ mark)***

……

    ***(ii)*** a solution of potassium bromide. ***(01 mark)***

……

(b).(i). Explain your answer in (a)(ii). ***(01 mark)***

……
……

(ii). Write ionic equation to show the reaction that took place in (a)(ii). ***(1½ marks)***

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## SECTION C

24. (a) Chlorine can be prepared in the laboratory using potassium manganate(VI), $KMnO_4$.

***(i)*** Name one substance that reacts with potassium manganate(VII) to produce chlorine. ***(01 mark)***

***(ii)*** State the condition for the reaction. ***(½ mark)***

***(iii)*** Write an equation for the reaction leading to the formation of chlorine. ***(1½ marks)***

(b) Damp blue litmus paper was dropped in a gas jar containing chlorine. State what was observed and explain your observation(s). ***(03 marks)***

(c). A boiling tube filled with chlorine water was inverted into a beaker containing chlorine water and exposed to sunlight for sometime,

***(i)*** State what was observed. ***(½ mark)***

***(ii)*** Explain with the aid of equation(s), your observation(s) in (c)(i) ***(03 marks)***

(d) Write an equation to show how chlorine can react with

***(i)*** dilute potassium hydroxide solution. ***(1½ marks)***

***(ii)*** turpentine, $C_{10}H_{16}$. ***(1 ½ marks)***

(e) Briefly describe a test you would carry out to confirm the presence of chloride ion in solution; State what would be observed and write an equation for the reaction that would take place. ***(2½ marks)***

25. (a) Explain how a dry sample of hydrogen chloride can be prepared from sodium chloride. *(your answer should include equation, but no diagram is required).* ***(6 ½ marks)***

(b). State what would be observed and write equation for the reaction that would take place if hydrogen chloride was passed

***(i)*** Over strongly heated iron wire. ***(2 ½ marks)***

***(ii)*** through aqueous silver nitrate. ***(2 ½ marks)***

(c) State what would be observed if chlorine was bubbled through a;

***(i)*** blue litmus solution ***(01 mark)***

***(ii)*** potassium bromide solution ***(01 mark)***

***(iii)*** solution of iron (II) ions ***(01 mark)***

(c) Write equation for the reaction in (b) (ii) and (iii). ***(03 marks)***

(d) Write equation for the reaction between chlorine and

***(i)*** heated iron ***(1½ marks)***

***(ii)*** cold dilute sodium hydroxide solution ***(1½ marks)***

***(iii)*** Hot concentrated potassium hydroxide solution ***(1½ marks)***

## END!!!

***"What men have done, Man can do!!!!!!"***