

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

For each of the following reactions, select from the list below, the **formula** of a sodium halide that would react as described.

NaF

NaCl

NaBr

NaI

Each **formula** may be selected once, more than once or not at all.

- (a) This sodium halide is a white solid that reacts with concentrated sulfuric acid to give a brown gas.

Formula of sodium halide _____

(1)

- (b) When a solution of this sodium halide is mixed with silver nitrate solution, no precipitate is formed.

Formula of sodium halide _____

(1)

- (c) When this solid sodium halide reacts with concentrated sulfuric acid, the reaction mixture remains white and steamy fumes are given off.

Formula of sodium halide _____

(1)

- (d) A colourless aqueous solution of this sodium halide reacts with orange bromine water to give a dark brown solution.

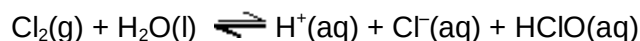
Formula of sodium halide _____

(1)

(Total 4 marks)

Q2.

- (a) When chlorine gas dissolves in cold water, a pale green solution is formed. In this solution, the following equilibrium is established.

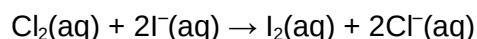


Give the formula of the species responsible for the pale green colour in the solution of chlorine in water.

Use Le Chatelier's principle to explain why the green colour disappears when sodium hydroxide solution is added to this solution.

(3)

- (b) Consider the following reaction in which iodide ions behave as reducing agents.



In terms of electrons, state the meaning of the term *reducing agent*.

Deduce the half-equation for the conversion of chlorine into chloride ions.

Explain why iodide ions are stronger reducing agents than chloride ions.

(4)

- (c) When chlorine reacts with water in bright sunlight, only two products are formed. One of these products is a colourless, odourless gas and the other is an acidic solution that reacts with silver nitrate solution to give a white precipitate.

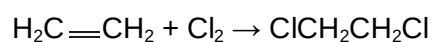
Write an equation for the reaction of chlorine with water in bright sunlight.

Name the white precipitate and state what you would observe when an excess of aqueous ammonia is added to it.

(3)

- (d) The reaction of chlorine with ethene is similar to that of bromine with ethene.

Name and outline a mechanism for the reaction of chlorine with ethene to form 1,2-dichloroethane, as shown by the following equation.



(5)

(Total 15 marks)