NAME…… **EXPECTED SCORE**……

PRE-UNEB PREPARATIONS 2022

FINAL STATEMENT ON; HALOGENS

5TH NOVEMBER 2022

SECTION A (attempt all in this section)

1. (a) (i) State **four** properties in which fluorine differs from iodine

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(ii) State two reasons for the anomalous behaviour of fluorine from the rest of the members in the group

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(iii) Chlorine is a gas while iodine is a solid both at room temperature. Explain this observation

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(b) State the conditions and write the equations for the reaction between sodium hydroxide and

(i) Fluorine

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(ii) Iodine

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(c) Compare the oxidizing powers of fluorine and iodine using their reactions with water

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2. The boiling points of the hydrides of group (VII) elements are given in the table
Below

Compound	**HF**	**HCl**	**HBr**	**HI**
Boiling point (°C)	+199	-85.0	66.7	-35.5

(a) Explain the trend in boiling points of the hydrides

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(b) Giving reasons, suggest the trend in the acid strength of the hydrides

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(c) Using equations where applicable, briefly explain what happens when conc. Sulphuric acid is mixed with each of the hydrides.

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(d) Arrange the following in order of their increasing acid strength. HClO, HClO2, HClO3, HClO4.

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(e) Explain your answer in d.

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3. State what is observed and write equation for the reaction when
(a) Chlorine is bubbled through a cold dilute solution of potassium hydroxide

Observations

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Equation

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(c) Bromine is bubbled through a solution of potassium iodide

Observations

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Equation

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(a) Iodine solution is added to sodium thiosulphate solution

Observations

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Equation

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(d) Excess chlorine is bubbled through a solution of sodium thiosulphate and barium chloride solution is added

Observations

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Equation

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(b) Chlorine is mixed with hydrogen sulphide gas

Observations

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Equation

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(i) Chlorine gas bubbled through sodium sulphite solution and barium chloride added

Observations

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Equation

SECTION B (attempt one question from this section)

4. (a) Describe briefly how chlorine can be produced on a large scale.
(b) Describe briefly how chlorine can be converted into potassium chlorate (V) crystals in the laboratory.
(c) 2.0g of a mixture of potassium chloride and potassium chlorate were dissolved in 250cm3 of water . 10cm3 of the solution was shaken with potassium iodide solution. The iodine liberated required 8.0cm3 of 0.2M sodium thiosulphate solution for complete reaction.
Potassium chlorate and potassium iodide react according to the equation.

$ClO3^{-}(aq) + 6H^{+}(aq) + I^{-}(aq \quad \rightarrow 3I2(aq) + Cl^{-}(aq) + 3H2O(l)$

5. (a) Explain why fluorine shows some differences in its properties from the rest of the group (VII) members of the periodic table.
(b) State the difference between the chemistry of fluorine rand the rest of the elements of group (VII) of the periodic table.
c)Describe the reactions of group (VII) elements with water

6. Explain the following observations
(a) Hydrofluoric acid forms acid salts while hydrochloric acid does not.
(b) Hydrogen fluoride is a liquid at room temperature while hydrogen chloride is a gas
(c) Hydrogen chloride can be prepared by the action of conc. Sulphuric acid on sodium chloride, while hydrogen iodide cannot be obtained in a similar way.
(d) Hydrogen fluoride is a stronger acid at higher concentration than when its dilute
(e) Hydrogen chloride is a stronger acid than hydrogen fluoride.

7. (a) Describe one general method of preparing halogens (except fluorine) in the laboratory. Write equation for the reaction
(a) Describe how you would distinguish the following pairs of ions
(i) Cl- and Br-
(ii) Br- and I-
(iii) I- and Cl-

END.

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