Practice Question Set For A-Level
Subject : Chemistry
Paper-1 Topic: Inorganic 1

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Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

Silver cyanide can be precipitated from sodium cyanide solution by adding an excess of silver nitrate solution.

Describe how you would obtain a pure dry sample of silver cyanide from this mixture.

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(Total 3 marks)

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Q2.

A student oxidised a solution of hydrochloric acid with a few drops of sodium chlorate(I) solution. The reaction mixture effervesced and turned pale green. The gas formed bleached universal indicator paper.

(a) Write a half-equation for the oxidation of chloride ions.

_____

(1)

(b) Write a half-equation for the reduction of chlorate(I) ions to chlorine in acidic conditions.

_____

(1)

(c) Write an overall equation for the redox reaction of chlorate(I) ions with hydrochloric acid.

_____

(1)

(d) A solution of sodium chlorate(I) was added to a colourless solution of potassium iodide. Suggest what is observed.

Explain the reaction that leads to this observation.

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_____

(3)

(Total 6 marks)

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Q3.

The halogens are the elements in Group 7.

(a) The electronegativities of the halogens are shown in the table.

Halogen	**Fluorine**	**Chlorine**	**Bromine**	**Iodine**
Electronegativity	4.0	3.0	2.8	2.5

Explain the trend in electronegativities shown by the halogens.

_____

_____

_____

_____

(2)

(b) The halogens can all behave as oxidising agents in reactions.

(i) Explain, in terms of electron transfer, the meaning of the term oxidising agent.

_____

_____

(1)

(ii) An equation for the reaction that takes place when chlorine gas is bubbled through aqueous potassium bromide is shown.

$$Cl_2(g) + 2KBr(aq) \longrightarrow Br_2(aq) + 2KCl(aq)$$

Explain, with reference to the oxidation states, why this is a redox reaction.

_____

_____

_____

(1)

(c) Solid sodium halides react with concentrated sulfuric acid.

(i) A sample of solid sodium iodide is reacted with concentrated sulfuric acid. A black solid forms and hydrogen sulfide gas is produced.

Write a half-equation for the reaction of sulfuric acid to form hydrogen sulfide.

_____

(1)

(ii) Write a half-equation for the formation of the black solid.

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_____

(1)

(iii) Use your answers to parts (c) (i) and (c) (ii) to write an overall equation for the reaction of sodium iodide with concentrated sulfuric acid.

_____

(1)

(iv) Give the role of sulfuric acid in its reaction with sodium iodide.

Tick (✔) **one** box.

Acid	☐
Oxidising agent	☐
Reducing agent	☐
Electrophile	☐

(1)

(v) Write an equation for the reaction of concentrated sulfuric acid with solid sodium fluoride.

_____

(1)

(vi) Suggest **one** reason why the reaction of sodium fluoride with concentrated sulfuric acid is different from the reaction with sodium iodide.

_____

(1)

(d) Chlorine reacts with water to form an equilibrium mixture containing hydrochloric acid and chloric(I) acid.

(i) Write an equation for the formation of this equilibrium mixture.

_____

(1)

(ii) Household bleach contains sodium chlorate(I) and sodium chloride.
State and explain, with reference to your equation in part **(d)(i)**, why it is dangerous to acidify an aqueous mixture of sodium chlorate(I) and sodium chloride.

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_____

(2)

(Total 13 marks)

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