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.

Chlorine is an important industrial chemical.

(a) Chlorine is formed when $KMnO_4$ reacts with hydrochloric acid.
The ionic equation for this redox reaction is

$$16H^+ + 2MnO_4^- + 10Cl^- \longrightarrow 2Mn^{2+} + 8H_2O + 5Cl_2$$

(i) Deduce the half-equation for the oxidation of chloride ions to chlorine.

_____

(1)

(ii) Give the oxidation state of manganese in the MnO_4^- ion.

_____

(1)

(iii) Deduce the half-equation for the reduction of the MnO_4^- ions in acidified solution to manganese(II) ions and water.

_____

(1)

(b) Chlorine behaves as an oxidising agent in the extraction of bromine from seawater.
In this process, chlorine gas is bubbled through a solution containing bromide ions.

(i) Write the **simplest ionic** equation for the reaction of chlorine with bromide ions.

_____

(1)

(ii) Give **one** observation that would be made during this reaction.

_____

_____

(1)

(iii) In terms of electrons, state the meaning of the term **oxidising agent**.

_____

_____

(1)

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(c) In sunlight, chlorine can also oxidise water slowly to form oxygen.

Write an equation for this reaction.
Give the oxidation state of chlorine in the chlorine-containing species that is formed.

Equation

_____

Oxidation state of chlorine in the species formed _____

(2)

(d) Explain why chlorine has a lower boiling point than bromine.

_____

_____

_____

_____

_____

_____

_____

(2)

(Total 10 marks)

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Q2.

The following pairs of compounds can be distinguished by simple test−tube reactions.

For each pair of compounds, give a reagent (or combination of reagents) that, when added separately to each compound, could be used to distinguish between them.
State what is observed in each case.

(a) Butan−2−ol and 2−methylpropan−2−ol

Reagent _____

Observation with butan−2−ol

_____

_____

Observation with 2−methylpropan−2−ol

_____

_____

(3)

(b) Propane and propene

Reagent _____

Observation with propane

_____

_____

Observation with propene

_____

_____

(3)

(c) Aqueous silver nitrate and aqueous sodium nitrate

Reagent _____

Observation with aqueous silver nitrate

_____

_____

Observation with aqueous sodium nitrate

_____

_____

(3)

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(d) Aqueous magnesium chloride and aqueous barium chloride

Reagent _____

Observation with aqueous magnesium chloride

_____

_____

Observation with aqueous barium chloride

_____

_____

(3)

(Total 12 marks)

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