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

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The table below shows observations of changes from some test-tube reactions of aqueous solutions of compounds **Q**, **R** and **S** with five different aqueous reagents. The initial colours of the solutions are not given.

	$BaCl_2$ + HCl	**$AgNO_3$ + HNO_3**	**NaOH**	**Na_2CO_3**	**HCl (conc)**
Q	no change observed	pale cream precipitate	white precipitate	white precipitate	no change observed
R	no change observd	white precipitate	white precipitate, dissolves in excess of NaOH	white precipitate, bubbles of a gas	no change observed
S	white precipitate	no change observed	brown precipitate	brown precipitate, bubbles of a gas	yellow solution

(a) Identify each of compounds **Q**, **R** and **S**.
You are **not** required to explain your answers.

Identity of **Q** _____

_____

Identity of **R** _____

_____

Identity of **S** _____

_____

(6)

(b) Write ionic equations for each of the positive observations with **S**.

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(4)

(Total 10 marks)

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Q2.

A Grignard reagent is a compound in which magnesium is bonded to an alkyl group (R) and a halogen (X). It can be represented by the formula RMgX.

A Grignard reagent is formed by the reaction of magnesium metal with a haloalkane using dry ethoxyethane as a solvent. Ethoxyethane has a boiling point of 35 ºC, forms a dense vapour and is highly flammable.

(a) Give **one** reason why a hot water bath is used rather than direct heating with a Bunsen burner when preparing the Grignard reagent.

_____

(1)

(b) Grignard reagents react with water.

Suggest **one** reason why the ethoxyethane protects the Grignard reagent from reacting with water vapour in the air.

_____

(1)

(c) A Grignard reagent can be used to introduce an extra carbon atom into an organic molecule. For example, propanone (CH_3COCH_3) reacts with CH_3MgBr in a two-stage process to form 2-methylpropan-2-ol, $(CH_3)_3COH$. The isomer 2-methylpropan-1-ol is not formed in this process.

Suggest a suitable reagent and the associated observations that could be used to distinguish between 2-methylpropan-2-ol and its isomer 2-methylpropan-1-ol.

Reagent _____

Observation with 2-methylpropan-2-ol _____

_____

Observation with 2-methylpropan-1-ol _____

_____

(3)

(d) At the end of the preparation of the alcohol, the bromine from the Grignard reagent remains as the bromide ion.
Suggest reagents and observations to confirm that this halide ion is Br^- and not I^-

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(4)

(Total 9 marks)

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