

EXTRA LAB # 3

Qualitative Analysis

Where reagents are selected for use in a test, the **name** or **correct formula** of the element or compound must be given.

At each stage of any test you are to record details of the following:

- colour changes seen;
- the formation of any precipitate and its solubility in an excess of the reagent added;
- the formation of any gas and its identification by a suitable test.

You should indicate clearly at what stage in a test a change occurs.

If any solution is warmed, a **boiling tube** must be used.

Rinse and reuse test-tubes and boiling tubes where possible.

No additional tests for ions present should be attempted.

(a) You will investigate **FA 6**.

Pour a 1 cm depth of hydrochloric acid into a test-tube.

Add a small spatula measure of **FA 6** to the acid.

Record your observations.

effervescence of a colourless gas which
gives pop sound with lighted splint

What can you deduce from your observations? Explain your answer.

FA 6 is a metal and produces H_2 gas with HCl

[3]

(b) (i) **FA 7** is a sodium compound containing an anion listed in the Qualitative Analysis Notes.

Heat a **small** spatula measure of **FA 7** in a hard-glass test-tube.

Heat strongly until no further change occurs, then leave the test-tube and contents to cool.

Record **all** your observations below.

* Solid melted
* a colourless liquid is formed
* A white or an off-white solid is formed on cooling

[2]

- (ii) Dissolve the remaining **FA 7** in a 5 cm depth of distilled water in a boiling tube. Label this solution **FA 8**.

FA 9 is a solution of a different sodium compound. The anion is listed in the Qualitative Analysis Notes.

Carry out the following tests on **FA 8** and **FA 9** and record your observations in the table.

test	observations with FA 8	observations with FA 9
To a 1 cm depth in a test-tube, add a few drops of aqueous acidified potassium manganate(VII).	no change / KMnO_4 remains purple	Purple solution of KMnO_4 turns colourless
To a 1 cm depth in a test-tube, add a few drops of aqueous barium chloride or aqueous barium nitrate.	no reaction / no ppt	white ppt
To a 1 cm depth in a boiling tube, add an equal volume of aqueous sodium hydroxide. Warm carefully , then	no reaction / red litmus paper remains unchanged	no reaction / red litmus paper remains unchanged
add aluminium foil.	fizzing, a colourless gas which turns damp red litmus paper blue.	fizzing, a colourless gas which gives pop sound with lighted splint.

[4]

- (iii) From your observations, suggest the anions present in **FA 8** and **FA 9**.

anion in **FA 8** NO_3^-

anion in **FA 9** SO_3^{2-}

[1]

- (iv) Give the ionic equation for any reaction observed in (b)(ii). Include state symbols.



[Total: 11]