To Identify Bio chemicals in an unknown substance

Introduction

The object of the experiment is to test a substance and identify the bio chemicals, which exist in that substance.

Food tests are used to identify which bio chemicals exist in a substance. The substances characterised are in the tests are:

carbohydrates, starch, lipids and peptide bonds.

Method:

The following tests were used to identify the relevant substances:

Benedicts Test

Carbohydrates – reducing sugars such as glucose fructose and maltose

- Add $2cm_3$ of a solution to a test tube.
- Add an equal volume of Benedicts solution.
- Shake and bring gently to the boil, shaking continuously to minimise spitting.

Red brown precipitate result indicates reducing sugars present

Disaccharide hydrolysis test and Benedicts test

Carbohydrates – non-reducing sugars such as sucrose

- Add 2cm3 of solution to a test tube .
- Add 1cm3 dilute hydrochloric acid.
- Boil for one minute.
- Carefully neutralise with sodium hydrogen carbonate
- Carry out Benedicts test

Brick red precipitate indicates reducing sugars present, if above test is negative

Heavier precipitate indicates reducing sugars present. if above test is positive

Starch Test

Starch

- Add 2cm3 1% solution to a test tube
- Add a few drops of I_2/KI solution.

A blue-black colouration indicates starch present

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Lipids Test

Lipids such as oils, fats and waxes.

- Add 2cm3 of absolute ethanol to a test tube
- Add 2cm3 of solution to the test tube
- Dissolve the solution by shaking vigorously
- Add an equal volume of cold water

A cloudy white suspension indicates lipids are present

Biuret Test

Add 2cm3 of solution to a test tube
Add an equal volume of 5% potassium hydroxide solution and mix
Add 2 drops of 1% copper sulphate solution and mix

A mauve or purple colour indicates peptide bonds are present

Results

Benedicts test

An unknown substance was tested and the test results were as follows:

Benedicts test – reducing sugars

As the solution was heated the substance changed from a brown to a light orange solution indicating a positive test.

Disaccharide hydrolysis test and Benedicts test

After boiling the litmus paper was dipped into the solution to check the Ph. The Ph turned red indicating a Ph of 1. Sufficient sodium hydroxide was added until the litmus paper turned olive green indicating a neutralised solution.

The Benedict's test was carried out on the neutralised solution. The solution turned orangey red after heating, indicating a posi tive result.

Starch test

After the I2/KI solution was added there was no change to the substance it did not have a blue-black colouration indicating a negative result.

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Results

Lipid test

After dissolving the solution in ethanol a cloudy white suspension did not form, indicating a negative result.

Biuret test

After adding potassium hydroxide and copper sulphate no colour developed indicating a negative result.

Conclusion

The unknown substance is a protein containing both reducing and non - reducing sugars.