

Edexcel IAL Biology A Level

Core Practical 1

Use a semi-quantitative method with Benedict's reagent to estimate the concentrations of reducing sugars and with iodine solution to estimate the concentrations of starch, using colour standards.



Benedict's test for reducing sugars

Independent variable: Concentration of reducing sugar

Dependent variable: Colour change of Benedict's reagent

All sugars can be classified as being reducing or non-reducing. A test with **Benedict's reagent** can not only reveal if it is a reducing sugar or not, but also **how strong** of a reducing agent it is.

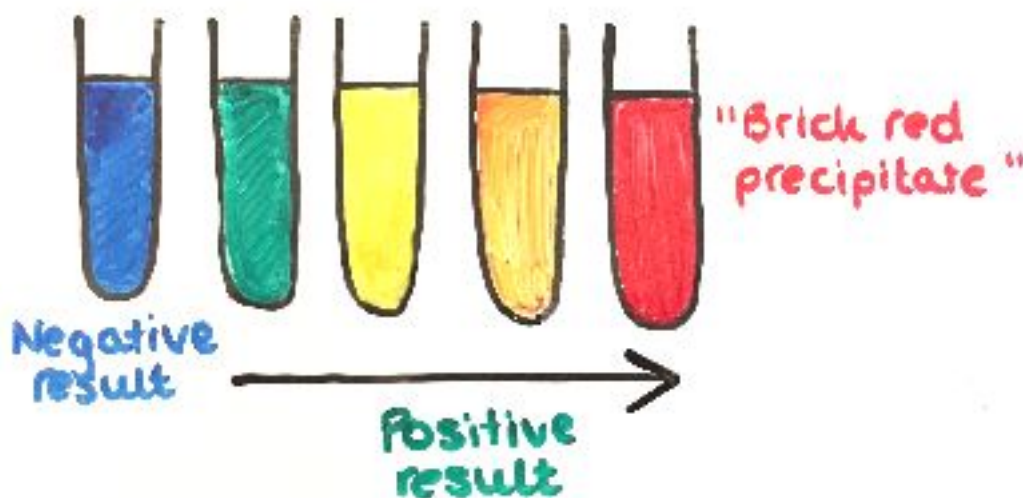
Equipment list

- Benedict's reagent
- Test tubes
- Water bath set to 90 °C
- Pipette(s)
- Test tube rack
- Stop watch

Method

1. Pipette 5 cm³ of the **solution being tested** into the test tube followed by 2 cm³ of **Benedict's reagent**.
2. Place the test tube into a test tube rack and then into the **water bath** and leave it for exactly 2 minutes.
3. Remove the test tube and observe its **colour**.

This test is semi-quantitative because by observing the colour change on a scale from blue to red it's possible to estimate the **concentration of the reducing sugar**. A **blue colour is a negative result** since this is the colour of the Benedict's reagent, while **colours closer to brick-red** give a **positive result** with an **increasing** concentration of reducing sugar.



Iodine test for starch

Method

1. Pipette 2 cm³ of the test solution into a test tube and add 2 drops of **potassium iodide solution**.
2. A colour change from **brown to blue-black** indicates the presence of **starch**.

Use of colour standards

The concentrations of both starch and reducing sugars can be estimated using **colour standards** which is when the benedict's test and iodine test for starch are carried out on **known concentrations of starch** and **reducing sugars**. The colours produced are known as colour standards to which the results of testing unknown solutions can be compared to estimate their concentrations.

Risk assessment

Hazard	Risk	Precaution
Liquids	Spillage that could cause surfaces to be slippery leading to an accident	Wipe up any liquid spillages as soon as they occur Put lids on bottles Put bottles away once used Keep away from edge of desk
Hot water bath	Scalding	Take care in removing and replacing the water bath lid and have a first aid kit nearby Remove test tubes from the water bath with tongs Keep away from edge of desk
Glassware	Cuts from sharp objects	Take care when handling glass objects Keep away from edge of desk

