Food tests

Specification reference:

AS Component: 1.1 **A level Component: Core concepts 1**

Chemical elements are joined together to form biological compounds

Introduction

The chemical composition of different foods can be determined by performing chemical tests. There are five tests which you need to know and understand how to use.

- Reducing sugars
- Non-reducing sugars
- Proteins
- Starch
- Fats and oils

These tests can be used on pure chemicals to demonstrate the positive results from each and then used to investigate the composition of different foods.

Apparatus and reagents

5 boiling tubes
2 test tubes
1 beaker
3 dropping pipettes
Benedict's reagent
Dilute hydrochloric acid (0.5 mol dm^{-3})
Dilute sodium hydroxide/ sodium bicarbonate
Biuret reagent
Iodine- potassium iodide solution
Absolute alcohol
Glucose solution
Sucrose solution
Albumen solution
Starch solution
Oil
Water bath

Method

Reducing sugars

1. Mix 2 cm^3 of the test solution with an equal volume of Benedict's reagent.
2. Heat the mixture in a water bath to between 70 °C and 90 °C for 5 minutes
3. Record your observations.

Non-reducing sugars

1. Mix 2 cm^3 of the test solution with an equal volume of Benedict's reagent.
2. Heat the mixture in a water bath to between 70 °C and 90 °C.
3. Observe and record colour change.
4. Put another 2 cm^3 of the test solution into a boiling tube, add 2 drops of hydrochloric acid and heat in a water bath to 70 °C and 90 °C for 2 minutes.
5. Add 2 drops of sodium hydroxide/ small spatula of sodium bicarbonate.
6. Add 2 cm^3 Benedict's reagent.
7. Heat the mixture in a water bath to between 70°C and 90 °C for 5 minutes.
8. Record your observations.

Proteins

1. Mix 2 cm^3 of the test solution with 2 cm^3 of Biuret reagent in a boiling tube.
2. Cover the top of the boiling tube and invert it once.
3. Record your observations.

Starch

1. Mix 2cm^3 of the test solution with 2 drops of iodine in potassium-iodide solution.
2. Record the colour change

Fats and oils

1. Mix the fat or oil with 5 cm^3 of absolute alcohol in a boiling tube.
2. Shake the tube.
3. Pour the mixture into another boiling tube half full of cold water.
4. Record your observations.

Use the methods given above to investigate the chemical content of some foods or unknown mixtures.