# Food Tests

| | Test for starch (Iodine test) | Test for Reducing Sugars (Benedict's solution test) | Test for Proteins (Biuret test) | Test for fats (Ethanol emulsion test) |
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| **Procedure** | Add 2 drops of iodine solution to $2cm^3$ of food sample in a test tube. | • Add $2cm^3$ of Benedict's solution to $2cm^3$ of food sample in a test tube.<br>• Place test tube in a boiling water bath for 5 minutes. | • Add $1cm^3$ of sodium hydroxide solution to $2cm^3$ of food sample in a test tube.<br>• Add 1% copper (II) sulfate solution, dropwise, shaking test tube well after each drop. | • Add $2cm^3$ of ethanol to $2cm^3$ of food sample. Shake the test tube well.<br>• Add $2cm^3$ of distilled water into the test tube. Shake test tube well. |
| **Positive results** | Iodine solution turns blue-black. | • Trace amounts of R.S.: Green precipitate (ppt) forms.<br>• Low amounts of R.S.: Yellow ppt forms.<br>• Moderate amounts of R.S.: Orange ppt forms.<br>• Large amounts of R.S.: Brick-red ppt forms. | Mixture turns violet. | A cloudy white emulsion forms. |
| **Negative results** | Iodine solution remains yellowish-brown. | Mixture remains blue. | Mixture remains blue. | Mixture remains colourless and clear. |
| **Principle behind test** | A polyiodide complex is formed with starch. | Benedict's solution contains copper (II) sulfate. Reducing sugars reduce the soluble blue copper (II) sulfate, containing copper (II) ions, to insoluble orange-red copper (II) oxide, which is observed as a precipitate. | In the presence of dilute copper (II) sulfate in alkaline solution, nitrogen atoms in the peptide bonds (in proteins) form a violet complex with copper (II) ions. | Fats are immiscible with water. Adding water to a solution of fats in alcohol results in an emulsion of tiny droplets in water which diffracts light and gives a white cloudy appearance. |