4.3 Food Tests

Mandatory experiment 4.1

(a) To test for the presence of starch

Apparatus required: 2 test-tubes; droppers

Chemicals required: iodine solution; starch solution

Method

1. Place 2 cm^3 starch solution in a test-tube.
2. Place the same volume of water in the second test-tube.
3. Add two to three drops of iodine solution to both test-tubes.
4. Gently shake the test-tubes and note any colour change.
5. Record your results.
6. Iodine is a blue colour when starch is present and a brown/yellow colour when starch is not present.

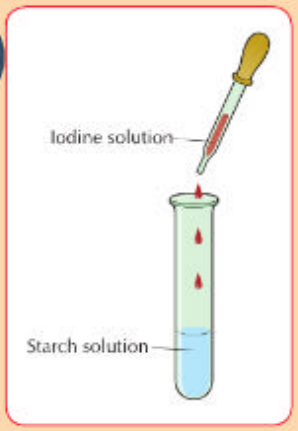

Fig. 4.7 Testing for starch.

(b) To test for the presence of a reducing sugar (glucose)

Note: Sugars like glucose are known as 'reducing sugars'. When heated, a reducing sugar turns Benedict's (or Fehling's) solution a brick-red colour. Not all sugars are reducing sugars, e.g. sucrose (table sugar) is not.

Apparatus required: 2 test- tubes; droppers; water bath (or 400 ml beaker; tripod; gauze; Bunsen burner); tongs

Chemicals required: glucose solution; Benedict's solution (or Fehling's solution)

Method

1. Set up the apparatus as shown in *Fig. 4.8*.
2. Stand the test-tubes into the boiling water bath for about three minutes.
3. Record any colour changes.

Results

The tube with the glucose solution turns a brick-red colour. The tube with the water stays blue.

Conclusion

The appearance of a brick-red colour indicates that a reducing sugar is present.

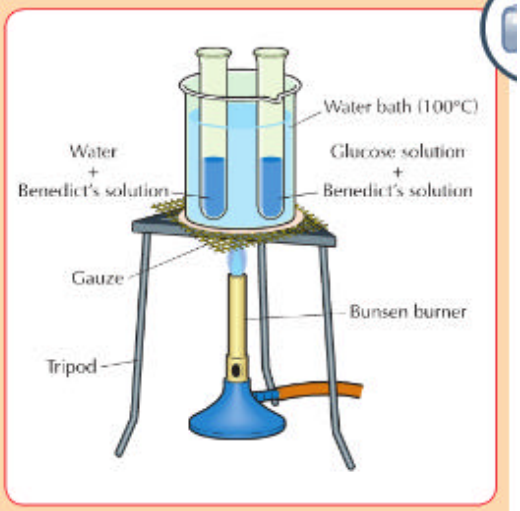

Fig. 4.8 Testing for reducing sugars.

(c) To test for the presence of protein

Apparatus required: 2 test- tubes; droppers

Chemicals required: sodium hydroxide solution; copper sulfate solution; protein solution, e.g. milk

Method

1. Set up two test-tubes as shown in *Fig. 4.9*.
2. Add three to four drops of copper sulfate solution to each test-tube. Swirl the test-tubes gently to mix the contents.

Result

The mixture with the milk turns a purple/ violet colour. The second test-tube containing only water remains blue.

Conclusion

Protein is present in the mixture containing milk. Protein is not present in the second test-tube containing only water.

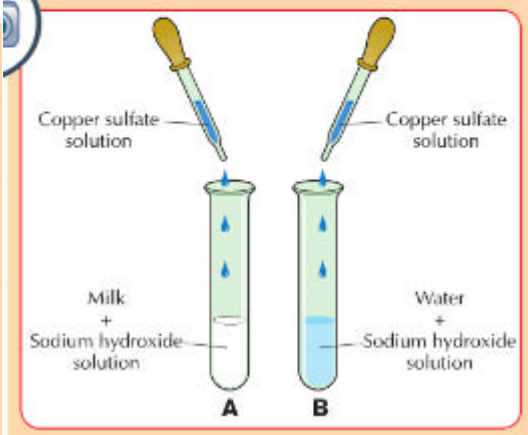

Fig. 4.9 Testing for protein.

(d) To test for the presence of fats

Materials required: brown paper; butter

Method

1. Label two pieces of brown paper *A* and *B*.
2. Rub some butter on *A*.
3. Put a drop of water on *B* and rub it in.
4. Allow both pieces of paper to dry.
5. Hold each piece of paper up to the light. Compare the amount of light that passes through.

Results

The place on the paper where the butter was rubbed will allow light to pass through. This is known as a translucent spot.

Conclusion

Fat is present on the paper rubbed with butter. There is no change in the paper rubbed with water. No light passes through it; therefore, fat is not present.

Fig. 4.10 The brown paper test for fats.

Mandatory experiment 4.2

To investigate the conversion of chemical energy in food into heat energy

Apparatus required: Bunsen burner; mounted needle; thermometer; boiling tube; graduated cylinder; retort stand; balance

Also required: cream cracker or a crisp

Method

1. Place 20cm³ water in a test-tube.
2. Record the temperature of the water using a thermometer.
3. Stick the mounted needle into the cracker.
4. Hold the piece of cracker in the Bunsen flame until it catches fire.
5. Now transfer the burning cracker under the water in the boiling tube, as in *Fig. 4.12*.
6. When the cracker has burnt out take the temperature of the water again.
7. Record the new temperature.
8. Compare the temperature of the water at the start and at the end.

Result

The temperature of the water will have risen.

Conclusion

The chemical energy in the cream cracker is converted into heat energy. Food contains energy.

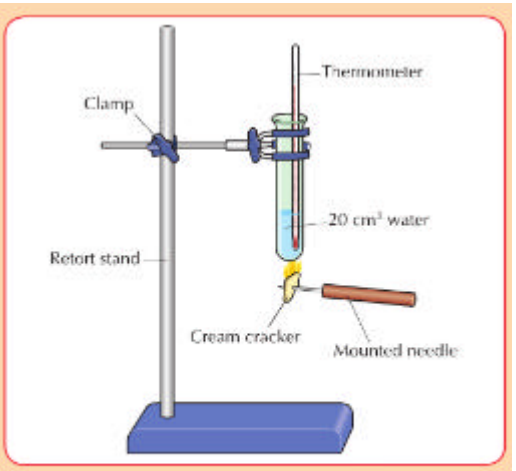

Fig. 4.12 Chemical energy in the cracker is converted into heat energy.