

Biological molecules and enzymes

Which elements are in carbohydrates and lipids?

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Which elements are in proteins?

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What are starch and glycogen made from?

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What are proteins and lipids made from?

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Food test for glucose?

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Food test for starch?

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Food test for protein?

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Food test for fat?

Carbon, hydrogen, oxygen and nitrogen,
and sometimes sulfur.

Carbon, hydrogen and oxygen.

Proteins: amino acids. Lipids: fatty acids
and glycerol (three fatty acids to one
glycerol).

Many simple sugars (glucose) joined
together.

Add iodine solution. Orange-brown turns
blue-black.

Add Benedict's solution and heat in a water
bath. Blue turns green, yellow, orange or
brick-red.

Shake the sample with ethanol, then pour
into water. A cloudy white emulsion shows
fat is present.

Add biuret reagent. Blue turns purple (lilac).

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What is an enzyme?

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What is the active site?

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Why are enzymes specific?

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Why does the rate rise with temperature up to the optimum?

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What happens to an enzyme above its optimum temperature?

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How does pH affect an enzyme?

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Practical: how do you show when amylase has digested all the starch?

Biological molecules and enzymes **Biology only**

Practical: how is pH varied and temperature kept constant in the amylase investigation?

The region of an enzyme with a shape complementary to its substrate, where the reaction takes place.

A protein that acts as a biological catalyst, speeding up metabolic reactions without being used up.

Particles have more kinetic energy, so enzyme and substrate collide more often.

Only a substrate with a shape complementary to the active site can fit, so each enzyme catalyses one type of reaction.

Away from the optimum pH the shape of the active site is altered, so the rate falls. At extreme pH the enzyme is denatured.

The shape of the active site changes, the substrate no longer fits and the enzyme is denatured.

Use buffer solutions of different pH and keep all tubes in a water bath at one temperature.

Test samples with iodine solution. When it stays orange-brown and does not turn blue-black, the starch has gone.