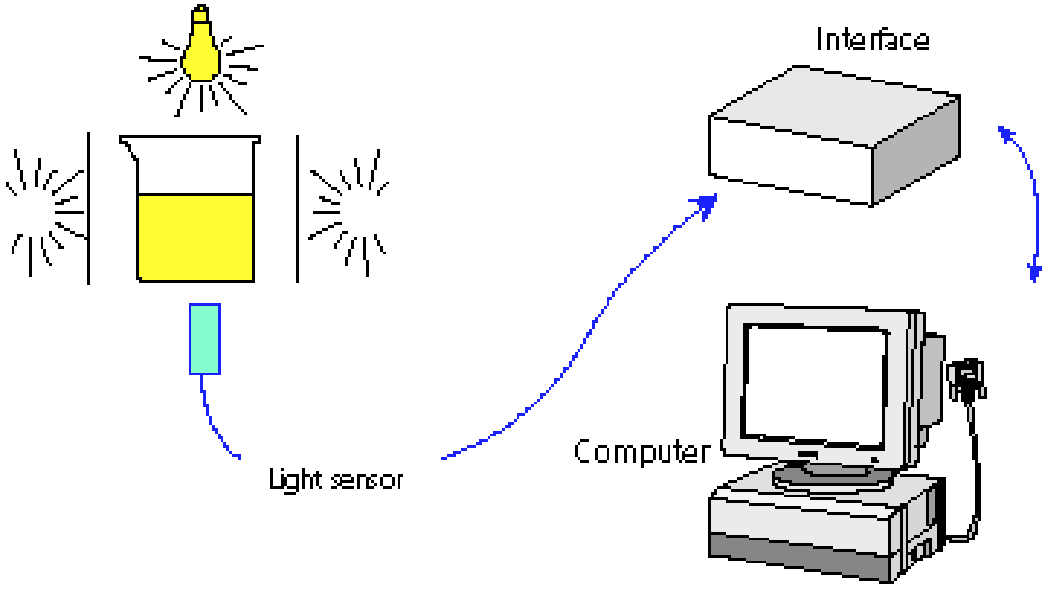
Enzymes: pepsin and protein



This experiment studies the effect of the enzyme pepsin on protein. Pepsin catalyses the hydrolysis of the protein, albumin into amino acids. As the protein solution is cloudy and amino acids are soluble the liquid changes from cloudy to clear. The light sensor can be used, like a colorimeter, to monitor this change.

You can try this at different pH values.

Apparatus

Water bath, 1g/100 cm^3 pepsin solution, 1% fresh egg white, 0.1M hydrochloric acid HCl, 0.1M sodium carbonate Na_2CO_3, light sensor.

Setting up

Set up the light sensor and beaker containing 25cm^3 of egg white + 5cm^3 acid.

Connect the light sensor to the interface. Warm the beaker in a 35°C water bath.

Some systems recognize the sensors you attach automatically, in others you do this yourself. Start the computer recording and look for a trace on the screen. If the light sensor is adjustable, change its range to get the trace on screen.

Recording the data

Remove the beaker from the water bath and place it over the light sensor. Add 10cm^3 pepsin solution to the beaker.

Record for 25 minutes.

When the reaction is complete, repeat the experiment using 25cm^3 of egg white and 5 cm^3 sodium carbonate instead of the 5 cm^3 acid.

Using the results

What happens to the appearance of the solution during the reaction?

What does the graph tell you about the progress of the reaction?

When was the reaction fastest?

What condition did you change? How has this affected the graph?

Calculate the average gradient of the graphs. Which part of the graph should you use?

Save your data on disk and print the graph.