

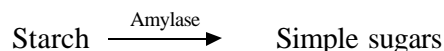
## ENZYME ACTION

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**NAME:** Amylase (clarase)

**DESCRIPTION:** Light coloured powder MC 23.31.

**ACTION:** The enzyme amylase acts on a starch substrate and breaks it into soluble sugars.



**STORAGE:** Store in the refrigerator at 4°C.

**SAFETY:** Enzymes are biologically active proteins and should be handled with care. Avoid direct contact or inhalation.

### TIPS FOR TEACHERS:

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#### Suggested pracs:

Equilibrate 5mL of 1% starch solution (use a soluble starch, e.g. MC39.7, that has been boiled and cooled) and 5mL of 1% amylase solution to 50°C in separate test tubes. Add 2mL of 0.1M ethanoic acid to the starch solution. Pour the starch solution into the enzyme solution and shake to mix. Maintain the temperature.

#### To monitor the progress of the reaction:

Place two drops of iodine solution (1.5% / 3% I/KI, MC26.1) into each of six wells of a Handy Tray (G11.38). Using a clean pipette, transfer two drops of the starch/amylase solution into the first well and record any change in colour. Repeat this process at set times. The strong blue colour that indicates the presence of starch will become less intense as the enzymic reaction progressively breaks down the starch. You can expect the starch to have been removed within 15 – 20 minutes.

#### Comments and further Ideas:

Organisms including humans use amylase to break down dietary starch to render it soluble and to allow it to be absorbed during digestion. Many industrial processes also use amylase. For example, it is sometimes used in brewing to remove haziness caused by residual (insoluble) starch in beer.

Investigate the effects of Temperature and pH on the rate of reaction.

Always run a control alongside your test solution by substituting distilled water for the Amylase solution.

Please note: Variations in substrate composition and enzyme activity can mean that the suggested experiment might not work exactly as described in every situation.