

# Edexcel (A) Biology A-level

## CP04 - Enzyme and substrate concentrations - rates of reactions

### Flashcards



What are the four factors that affect enzyme activity?



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1. Enzyme concentration
2. Substrate concentration
3. Temperature
4. pH



How is a control set up in a practical measuring enzyme activity?



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Replace the enzyme solution with distilled water or boiled enzyme solution.



Outline the practical procedure used to measure the effect of enzyme concentration on enzyme activity, using trypsin and milk.



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1. Dilute stock solution of trypsin with distilled water to produce 4 concentrations. Set up a control and use it to set the colorimeter absorbance to zero.
2. To another cuvette, add  $2 \text{ cm}^3$  of milk suspension and  $2 \text{ cm}^3$  of the stock trypsin solution. Mix, place in the colorimeter and measure absorbance at 15 second intervals for 5 minutes.
3. Rinse the cuvette with distilled water.
4. Repeat step 3 at all trypsin concentrations.



How is the rate of reaction calculated from time?





How is the rate of reaction calculated from time?

Rate of reaction =  $1/\text{time}$



What is the effect of enzyme concentration on enzyme activity?



## What is the effect of enzyme concentration on enzyme activity?

As the concentration of enzyme increases, the number of ES complexes formed increases as successful collisions are more frequent, so the rate of reaction increases to an optimum.

Beyond the optimum, the rate plateaus as substrate concentration becomes limiting.



What is the risk and level of risk associated with handling enzymes?



What is the risk and level of risk associated with handling enzymes?

Students may have allergic reactions to enzymes, so avoid contact with skin and eyes, wear eye protection.

Low risk.

