

AQA Biology A-level

RP11 - Measuring the Concentration of Glucose using a Calibration Curve

Flashcards

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How can Benedict's solution be used to measure the concentration of glucose in a solution?



How can Benedict's solution be used to measure the concentration of glucose in a solution?

Use a colorimeter to measure the absorbance of a series of solutions of known concentrations to create a calibration curve. Compare the absorbance of an unknown sample to the calibration curve.



What is a serial dilution?



What is a serial dilution?

A dilution where successive concentrations increase/decrease in a logarithmic fashion



Outline the procedure of this practical.



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1. Make a serial dilution of glucose, ranging from 0 to 10 mmol dm⁻³.
2. Place 2 cm³ of each of the unknown samples in separate boiling tubes.
3. Add 2 cm³ of Benedict's solution to all boiling tubes.
4. Place boiling tubes in a water bath at 90°C for four minutes.
5. Zero the colorimeter using a cuvette with distilled water and set to red filter.
6. Place known samples into cuvette and measure the absorbance of each using the colorimeter.
7. Make a calibration curve.
8. Measure the absorbance of the unknown samples using the colorimeter. Use the calibration curve to determine glucose concentrations.



What are the axes in a calibration curve?



What are the axes in a calibration curve?

Absorbance against glucose concentration.



What would a high glucose concentration
in urine suggest?



What would a high glucose concentration in urine suggest?

It may suggest diabetes. Lack of insulin leads to high blood glucose concentration, hence high concentration in the glomerular filtrate, so not all glucose can be reabsorbed in the proximal convoluted tubule.



State the hazards and precautions of this practical.



State the hazards and precautions of this practical.

Benedict's solution is an irritant, wear eye protection, avoid contact with skin.

Handle the hot water bath with care.



How can you increase the accuracy of the estimate of the unknown glucose solution?



How can you increase the accuracy of the estimate of the unknown glucose solution?

Increase the number of concentrations (at smaller intervals) for the calibration curve within the range of concentrations that the unknown solution belongs in.

