

WJEC England Biology

A-level

SP CC 03c - Cell Membrane Permeability

Flashcards

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State 2 factors that affect the permeability of cell membranes.



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Temperature

Concentration of solvents (ethanol)



How is beetroot used to measure the permeability of cell membranes?



How is beetroot used to measure the permeability of cell membranes?

The higher the permeability, the more red pigment that leaks out into the surrounding solution within a given time. A colorimeter can be used to determine the absorbance, hence concentration of pigment.



Outline the procedure to investigate the effect of temperature on the permeability of a cell membrane.



Outline the procedure to investigate the effect of temperature on the permeability of a cell membrane.

1. Cut beetroot into 8 identical cubes with a scalpel.
2. Place each cube in a different test tube with equal volumes of distilled water.
3. Place each test tube into water baths ranging from 30-80° C. Leave for 20 minutes.
4. Filter each solution out into a cuvette and measure the absorbance.



What are the safety hazards involved in testing the effect of ethanol concentration on membrane permeability?



What are the safety hazards involved in testing the effect of ethanol concentration on membrane permeability?

Ethanol is an irritant and is flammable, keep away from naked flames, wear eye protection.

Keep sharp scalpel away from fingers.

Handle hot liquid with care.



Explain the effect of temperature on membrane permeability?



What is the effect of temperature on membrane permeability?

Increasing temperature results in increased membrane permeability, as high temperatures denature the membrane proteins. This creates gaps in the membrane for molecules to pass through.

Increasing temperature also increases the kinetic energy of phospholipids so they move more and are less compact, increasing the permeability.



What is the exception to the general trend of increasing temperature and membrane permeability?



What is the exception to the general trend of increasing temperature and membrane permeability?

At temperatures below 0°C , ice crystals form and pierce the membrane, forming holes for substances to leak out.



What is the effect of ethanol concentration on membrane permeability?



What is the effect of ethanol concentration on membrane permeability?

Increasing ethanol concentration leads to increased membrane permeability, as ethanol ruptures the membrane to form gaps more molecules to pass through.

