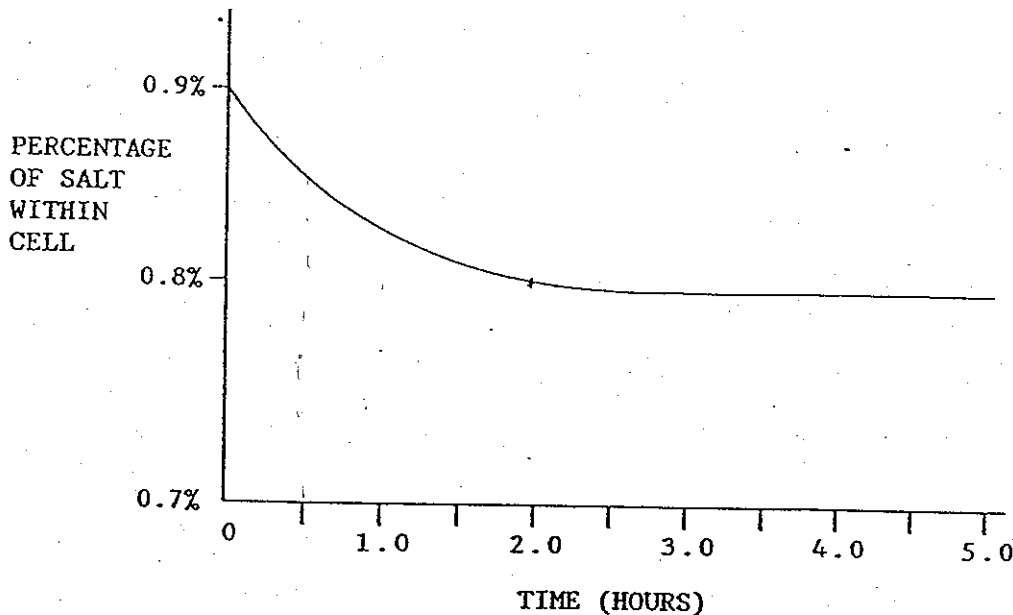


Osmosis + Diffusion Question (June 87)

Name KEY

TIME VS. PERCENTAGE OF SALT WITHIN A CELL



A plant cell is placed in an unknown salt solution. The cell membrane is impermeable to salt. The above graph represents the change in salt concentration WITHIN the cell.

- (a) Describe the concentration (or tonicity) of the solution which surrounds the plant cell at 0.5 hours.

Solution is hypotonic to cell

- (b) Explain the results shown on the graph:

between 0.5 hours and 2.0 hours cell is gaining water (deplasmolysis) due to it being placed into a hypotonic solution. OP of cell decreases.

between 2.0 and 4.0 hours

cell is isotonic to solution → no water gain/loss

- (c) If salt were added to the solution surrounding the cell at hour 4.0, describe how the graph would appear and explain your answer.

graph would increase as cell would then be hypotonic to solution → water would leave cell (plasmolysis) increasing cell's osmotic pressure
 (d) Describe the appearance of the plant cell after salt was added to the solution.
 shriveled (perhaps crenated)

A)

Figure 3.4 shows three microscope fields containing red blood cells. Arrows indicate the direction of net osmosis. Select three different colors and use them to color the coding circles and the corresponding cells in the diagrams. Then, respond to the questions below, referring to Figure 3.4 and inserting your answers in the spaces provided.

- Water moves into the cells
- Water enters and exits the cells at the same rate
- Water moves out of the cells

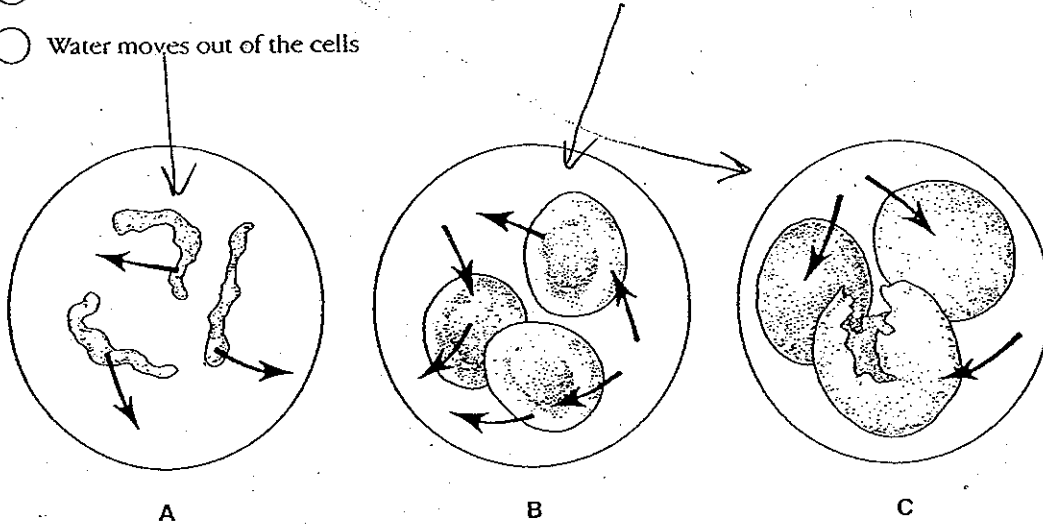


Figure 3.4

- Name the type of tonicity illustrated in diagrams A, B, and C.
 A. cells placed in HYPERTONIC SOL'N B. cells in ISOTONIC SOL'N C. cells placed in HYPOTONIC SOL'N
- Name the terms that describe the cellular shapes in diagrams A, B, and C.
 A. Shriveled - CRENATION B. NORMAL C. Swelled - LYSIS
- What does *isotonic* mean? equal in concentration
- Why are the cells in diagram C bursting? taking in too much WATER!

B)

In Figure 3.13, an artificial cell with an aqueous solution enclosed in a selectively permeable membrane has just been immersed in a beaker containing a different solution. The membrane is permeable to water and to the simple sugars glucose and fructose, but is completely impermeable to the disaccharide sucrose. Answer the following questions pertaining to this situation.

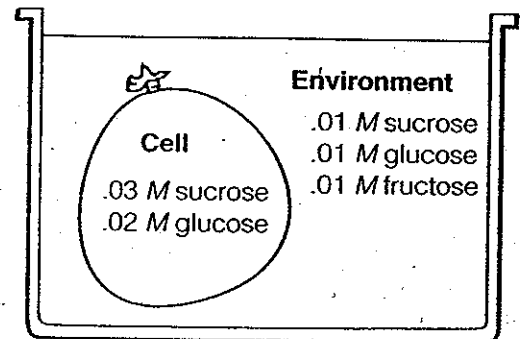


Figure 3.13

- Which solute(s) will exhibit net diffusion into the cell? fructose
- Which solute(s) will exhibit net diffusion out of the cell? glucose
- In which direction will there be net osmotic movement of water? environment to cell
- Will the cell crenate or swell? swell