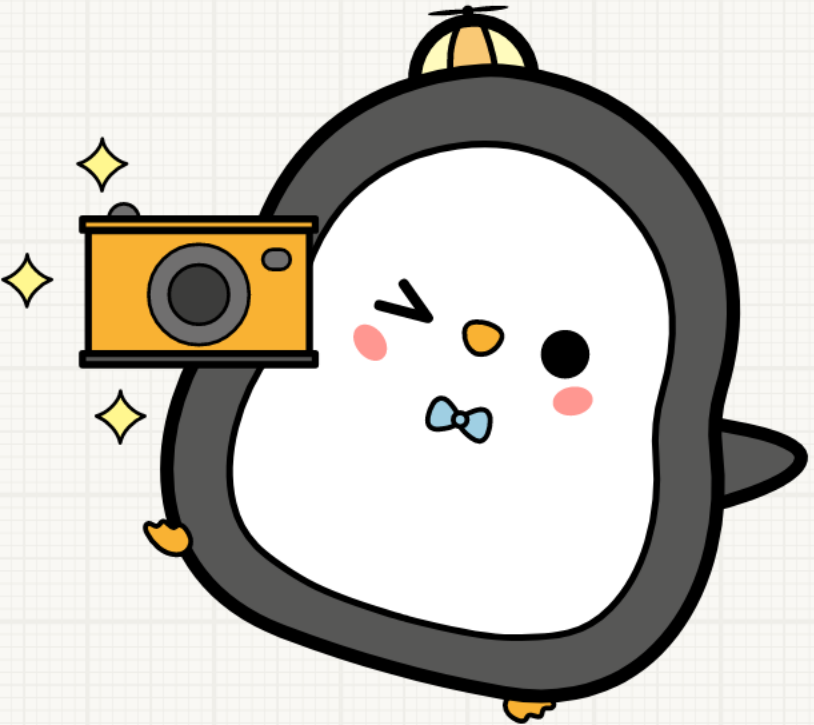
AP Bio Math Mondays

Solute Potential

NOTES

Solute Potential

$$\Psi_S = -iCRT$$



Identification of Variables

Solute Potential

$$\Psi_s = -iCRT$$

i = ionization constant
(1.0 for sucrose)

C = molar concentration

R = pressure constant
(R = 0.0831 liter bars/mole K)

T = temperature in Kelvin
(°C + 273)

Math Monday #4

Solute Potential

Potato cores were placed in solutions of varying concentrations and were found to neither gain nor lose mass in a sucrose solution of 0.32M. Use this information to calculate the solute potential of the potato cores. The temperature of the solution is 22°C.

Solute Potential

$$\Psi_S = -iCRT$$

$i = 1.0$

$C = 0.32\ M$

$R = 0.0831$ liter bars/mole K

$T = (22°C + 273) = 295\ K$

Math Monday #4

Solute Potential

Potato cores were placed in solutions of varying concentrations and were found to neither gain nor lose mass in a sucrose solution of 0.32M. Use this information to calculate the solute potential of the potato cores. The temperature of the solution is 22°C.

Solute Potential

$$\Psi_S = -iCRT$$

$i = 1.0$
$C = 0.32\ M$
$R = 0.0831$ liter bars/mole K
$T = 295\ K$

$$\Psi_S = -1.0(0.32\ M)(0.0831 \text{ liter bars/mole K})(295\ K)$$

$$\Psi_S = -7.84 \text{ bars}$$

Example Problem Solute Potential

A cell is in equilibrium with its surroundings. The molarity of the surrounding solution is 0.8M. Calculate the solute potential of the surrounding solution assuming i = 1.0 and room temperature of 293 K.

Solute Potential

$$\Psi_S = -iCRT$$

$i = 1.0$
$C = 0.8\ M$
$R = 0.0831$ liter bars/mole K
$T = 293$ K.

$$\Psi_S = -1.0(0.8\ M)(0.0831 \text{ liter bars/mole K})(297\ K)$$

$$\Psi_S = -19.74 \text{ bars}$$