

## Water Potential Problems

1. Calculate the osmotic potential ( $\Psi_s$ ) of a 2.4 M sucrose solution at 24°C. Show your work.

### Water Potential ( $\Psi$ )

$$\Psi = \Psi_p + \Psi_s$$

$\Psi_p$  = pressure potential

$\Psi_s$  = solute potential

The water potential will be equal to the solute potential of a solution in an open container, since the pressure potential of the solution in an open container is zero.

### The Solute Potential of the Solution

$$\Psi_s = -iCRT$$

$i$  = ionization constant (For sucrose this is 1.0 because sucrose does not ionize in water)

$C$  = molar concentration

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

$T$  = temperature in Kelvin ( $273 + ^\circ\text{C}$ )

2. A cell is in equilibrium with its surroundings. The molarity of the surrounding solution is 0.5M. The temperature is 20°C
  - a) Calculate the solute potential of the surrounding solution.