

AP Water Potential Sample Questions

Name: \_\_\_\_\_

1. If a cell's  $\Psi_P = 2$  bars and its  $\Psi_S = -3.5$  bars, what is the resulting  $\Psi$ ?
2. The cell from question #1 is placed in a beaker of sugar water with  $\Psi_S = -4.0$  bars. In which direction will the net flow of water be?
3. The original cell from question # 1 is placed in a beaker of sugar water with  $\Psi_S = -0.15$  MPa (megapascals). We know that 1 MPa = 10 bars. In which direction will the net flow of water be?
4. The value for  $\Psi$  in root tissue was found to be -3.3 bars. If you take the root tissue and place it in a 0.1 M solution of sucrose at 20°C in an open beaker, what is the  $\Psi$  of the solution, and in which direction would the net flow of water be?
5. NaCl dissociates into 2 particles in water:  $\text{Na}^+$  and  $\text{Cl}^-$ . If the solution in question 4 contained 0.1M NaCl instead of 0.1M sucrose, what is the  $\Psi$  of the solution, and in which direction would the net flow of water be?
6. A plant cell with a  $\Psi_S$  of -7.5 bars keeps a constant volume when immersed in an open-beaker solution that has a  $\Psi_S$  of -4 bars. What is the cell's  $\Psi_P$ ?
7. At 20°C, a cell containing 0.6M glucose is in equilibrium with its surrounding solution containing 0.5M glucose in an open container. What is the cell's  $\Psi_P$ ?