

Water and Intermolecular Forces

Show your work on all calculations.

- 1.a. Calculate the osmotic pressure at 37°C of an isotonic saline solution, which is 0.9% (w/v) NaCl.
 - b. If you want to give a patient an isotonic solution of glucose, what should the molarity of the glucose solution be? If you need to prepare a 0.50 L of this solution, how will you do it?
 - c. If you miscalculate and give a patient an intravenous glucose solution that is hypertonic, what will happen? Explain.
2. What concentrations of dihydrogen phosphate and hydrogen phosphate are required to give a 0.25-M phosphate buffer system of pH 7.40? See your book for relevant K_a values.
3. Write a Lewis structure for each of the following substances. In a Lewis structures, you must show all bonds and lone pairs! Give the **strongest** type of intermolecular force that can occur between each pair. "Van der Waal's interaction" is a general term and should not be used in your answer. Then, using the structures you have drawn, show this interaction with a dotted line. Comment on the strength of each of these interactions.
- a. water and chloroform
 - b. hexanoic acid and water
 - c. methylammonium ion and benzene
 - d. molecular oxygen and water
4. On graph paper, sketch a titration curve for carbonic acid. Check your book for K_a values.