

**Phys 404**  
**Spring 2010**  
**Homework 6, CHAPTERS 5 AND 6**  
**Due Thursday, April 1, 2010 @ 12:30 PM**

**HOUR EXAM THURSDAY, APRIL 8, WILL COVER CHAPTERS 3, 4, 5 AND 6.** Once again, no notes, books, electronics, screens, or calculators are allowed in the exam

**Chapter 5 assignment:**

Read chapter 5, then do

1. K+K, Chapter 5, Problem 6
2. K+K, Chapter 5, Problem 7
3. K+K, Chapter 5, Problem 8 Hint: The example in the text starting on p. 140 is useful reading before doing this problem.
4. K+K, Chapter 5, Problem 10 Hint: Note that you do not need to derive Eq. (84) here, it is just given for interest, but you could derive it from the expression for the chemical potential for an ideal gas, Eq. (12a) on p. 121, if you replace  $n=N/V$  by  $n=\langle N \rangle/V$ .
5. K+K, Chapter 5, Problem 12 Hint: Take the condition for equilibrium seriously. The water vapor at the base can be approximated as an ideal gas, so you can calculate its internal chemical potential. If the pool of water is in equilibrium with the water vapor, you know the pool's internal chemical potential. If the base of the tree is in equilibrium with the pool, ... The "osmotic force" which causes water to move upward in plants is quite large.

**Chapter 6 assignment:**

Read chapter 6, then do

6. K+K Chapter 6, Problem 1
7. K+K Chapter 6, Problem 3
8. K+K Chapter 6, Problem 5
9. K+K Chapter 6, Problem 6 Hint: Consider the systems to be ideal gases.