**Final Exam Review – Topics**

Like all review sheets, this sheet has questions that are very similar to the ones on the final exam. However, we’re going to try something a little new:

Instead of this being a normal review sheet, this sheet is going to potentially bring your grade up in the class:

* You may choose to either work on this sheet in a group or by yourself. If you work with it in a group, the review will be identical to all other review sheets. If you choose to work on it individually, you may use the review sheet as a “cheat sheet” for the final exam.
* If you choose to work on this sheet by yourself, I will grade it as a quiz for fourth quarter. If this quiz brings up your grade, it will replace your lowest quarter grade. If this quiz does not bring up your grade, the grade will not be used to calculate your quarter grade. In other words, there’s no way to lose points!
* If you choose to do this assignment for credit, it will be due at the end of class on Thursday so I can grade it before class the next day.
* On the final day of review week we will go over the answers to the review sheet so you understand what questions you have had problems with.

And now with the questions!

1. Let’s say that for some unspecified reason I have 0.45 liters of helium at a pressure of 0.85 atm at a temperature of 270 C. Given this information, how many moles of helium are in this container? (R = 0.08206 L atm/mol K)
2. If I were to heat this helium-filled container until the temperature of the gas was 350C, what would the new volume of this container be?
3. Is helium an ideal gas? Explain why or why not.
4. What are the four assumptions made in the kinetic molecular theory?
5. Using the kinetic molecular theory, explain why heating a gas causes its pressure to increase.
6. What is an acid, and how can you tell it is an acid from its formula?
7. What is the pH of a 0.0080 M solution of NaOH?
8. What is the pH of a 2.3 x 10-4 M solution of HNO3?
9. I’m going to do a titration:
10. What is a titration?
11. I have a beaker that contains 500 mL of a base that has an unknown concentration. If it takes 340 mL of 1.5 M HCl to neutralize this base, what is the concentration of this base?
12. What is the pH of this base?
13. Why would it have been impossible for me to perform the titration in 9b using KOH instead of HCl? Explain
14. How did I know when to stop this titration?
15. The solution we titrated in part d was a base. What are some properties you might expect this solution to have, based on the general properties of bases?