**Final Exam Review, Topics (2024 version)**

The following review sheet is intended to give you a good idea of what will be on the final exam for this class. The questions on this review sheet are intended as a good guide for the things you might be asked. However, please keep in mind that they will not be the exact questions that are on the final exam, so you still have to study.

Some things that you might find useful to know:

* The final exam consists of 15 short answer questions (just like the ones on the tests and quizzes) and 10 matching questions.
* The questions on this review sheet are meant to give you a good idea of what’s on the final. As a result, if I ask you to find pressure using the combined gas law you should take this to mean that you need to know how to find pressure, volume, and temperature. Use this as a study *guide*, not as the final word about what you need to do for the exam.
* This study guide is meant to be about as difficult and lengthy as the actual exam. If it takes you a long time to do it, you might want to do some more studying!

So, without further ado, here are the questions:

1) I have 2.45 liters of nitrogen in a balloon at a temperature of 350 degrees Celsius. If I increase the temperature of the balloon to 550 degrees Celsius, how big will the balloon become? (Note: This question should be a good indication to you that I’ll want you to use the combined gas law in some form on this exam).

2) I have 2.45 liters of nitrogen in a balloon at a temperature of 350 degrees Celsius and a pressure of 1.5 atm. If the formula of nitrogen is N2, how many moles and how many grams of nitrogen will be present in this balloon? R = 0.08206 Latm/molK. (Note: This question should let you know that I want you to be able to know the ideal gas law, as well as how to convert moles to grams).

3) Why do all ideal gases mix with each other? (Note: This suggests that I want you to know what an ideal gas is and where its properties come from).

4) Why do we have to use temperature in Kelvin when working with ideal gases? (Note: This lets you know that I’m interested in having you understand what the postulates of the kinetic molecular theory are and why they have the characteristics they do).

5) Why do ionic compounds have such high melting and boiling points, whereas covalent compounds have low melting and boiling points? (Note: This is asking you to understand the basic structure of ionic and covalent compounds and how they result in their observed properties).

6) Why don’t covalent compounds conduct electricity? (Note: I’m looking for you to understand why ionic and covalent compounds have their observed properties).

7) What are the masses of NaNO3 and Pb(SO4)2? (Know how to find molar masses).

8) Define the following terms: ionic bond, covalent bond, polarity, mole, molar mass, ideal gas, law of conservation of mass, conductivity, brittle, malleable (and about anything else you can think of!)

9) How many moles are in 450 grams of Li2SO4?

10) How many grams are in 450 moles of HNO3?

11) Balance these equations:

\_\_\_\_ Na + \_\_\_\_ Ca3P2 → \_\_\_\_ Na3P + \_\_\_\_ Ca

\_\_\_\_ C2H4 + \_\_\_\_ O2 → \_\_\_\_ CO2 + \_\_\_\_ H2O

\_\_\_\_ MgO + \_\_\_\_ S8 → \_\_\_\_ MgS + \_\_\_\_ O2

\_\_\_\_ H3PO4 + \_\_\_\_ NaOH → \_\_\_\_ Na3PO4 + \_\_\_\_ H2O

\_\_\_\_ Mg3P2 + \_\_\_\_ AlF3 → \_\_\_\_ MgF2 + \_\_\_\_ AlP

\_\_\_\_\_ C3H6 + \_\_\_\_\_ O2 → \_\_\_\_\_ CO2 + \_\_\_\_\_ H2O

\_\_\_\_\_ Li3P + \_\_\_\_\_ Pb(OH)2 → \_\_\_\_\_ LiOH + \_\_\_\_\_ Pb3P2

\_\_\_\_\_ C2H4 + \_\_\_\_\_ Br2 → \_\_\_\_\_ C2Br4 + \_\_\_\_\_ H2