

Ch. 4 Test Review – The Arrangement of Electrons in Atoms

Before taking this test, make sure you have done the following things to prepare:

- 1) watched the lecture videos for Ch. 4,
- 2) reviewed your video logs and guided reading for Ch. 4,
- 3) studied the flashcards from Ch. 4,
- 4) reviewed your daily work assignments and quizzes from Ch.4, &
- 5) complete this test review.

On this test you will need to know how to solve for wavelength(λ) or frequency using the speed of light. Make sure you can use the formula: $c = \lambda \cdot f$. You will also need to be able to solve for the energy of a photon using this formula: $E = h \cdot f$. You will be provided the values for c & h since they are universal constants. Also make sure you know how to do electron configuration the long way, the noble gas electron configurations (AKA, the shortcut), and orbital filling diagrams.

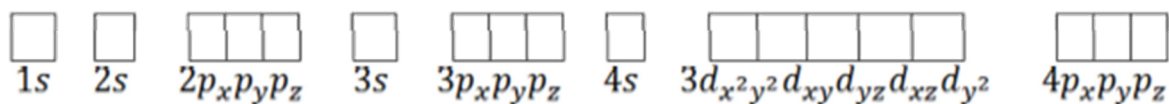
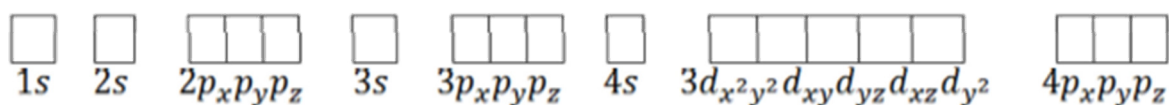
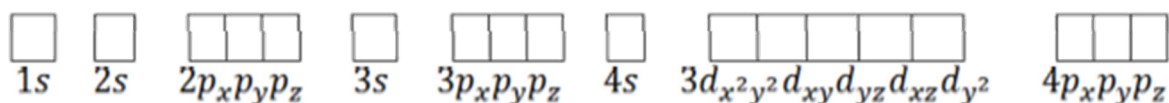
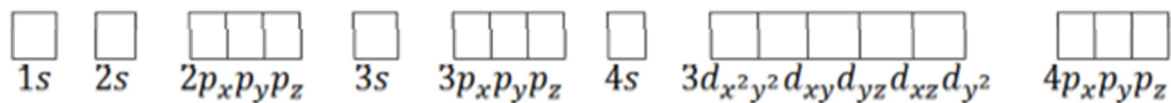
Knowledge:

1. How does wavelength and frequency relate? (As one increases does the other one increase or decrease?) Is this a direct or inverse relationship?
2. Define wavelength and frequency. What is the symbol for each?
3. What is the energy of a photon related to?
4. What is a line emission spectrum?
5. Explains hydrogen's line-emission spectrum and who discovered what we know about it.
6. What does the Bohr model state about where an electron is?
7. What is the lowest energy state of an atom?
8. What type of electromagnetic radiation has the highest energy? (Hint: The highest frequency is the highest energy.)
9. What type of EM radiation has the longest wavelength?

Problems:

10. If the frequency of a light is 3.2×10^{15} Hz, what is the wavelength?
11. What is the frequency of an EM wave with a wavelength of 5×10^{-6} m?
12. How much energy is in a photon with a frequency of 2.3×10^{13} Hz?
13. How much energy is in a photon with a wavelength of 2.1×10^{-8} m (2steps)

14. Can you draw orbital diagrams for the following: Ga, Ne, Na, V, (orbital diagrams use the boxes below with electrons represented by arrows. On the test, you will simply have to look at pre-filled boxes to select the correct answer from multiple choice answers.



15. Write the electron configuration for the following atoms: B, K, F, Na, Ar, As, Ca, Kr.

16. Write electron diagrams for the following using noble gas notation: Fe, Ni, N, Mg, Al