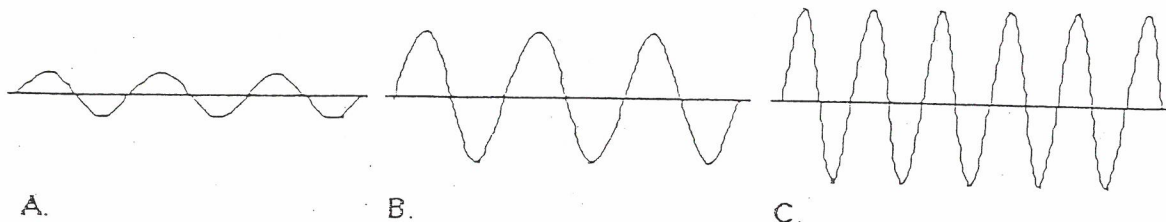


Test v.2: Ch5 Electrons in Atoms

Do not write on this paper

On all math problems show the given, formula used, and work to receive full credit.

1. Which color of light in the continuous spectrum has the shortest wavelength?



2. Which diagram above represents light with the lowest energy?
3. A photon of orange light has more energy than a photon of \_\_\_\_\_ light.
4. A photon of blue-green light has a frequency of  $7.23 \times 10^{14}$  Hz and a wavelength of  $4.76 \times 10^{-7}$  meters. What is the amount of energy released by this photon?
5. With the exception of visible light (ROY G. BIV), list at least three other areas of the electromagnetic spectrum.
6. In class we described the steps necessary for a photon of visible light to be emitted from an atom. List the 3 steps necessary for this to occur. Include the diagram. (8 points)
7. Name the part of the periodic table where the s orbitals are being filled?
8. Write the electron configuration and orbital diagram for the following atoms.
- Cobalt
  - $\text{Se}^{-2}$
  - $\text{Mn}^{+2}$
  - Th
9. The light energy given off by an "excited" atom is equal to the energy \_\_\_\_\_ as electrons return to a \_\_\_\_\_ level.
10. As the wavelength of a standing wave increases, the frequency \_\_\_\_\_.
11. State the 3 rules for electron configuration. (6 points)
12. For all electromagnetic waves, the product of \_\_\_\_\_ and \_\_\_\_\_ always equals the speed of light.
13. What is wavelength of a light with the energy of  $3.2 \times 10^{-18}$  J? (2 steps need to solve. Solve for frequency first)
14. A wave has a length of  $8.70 \times 10^{-6}$  m. What is its frequency?

15. Each color of light has its own \_\_\_\_\_ and \_\_\_\_\_.
- ~~16. The number of possible orbitals in an energy level is equal to \_\_\_\_\_.~~
17. In a vacuum, visible light travels at the \_\_\_\_\_.
18. The hertz is a measure of \_\_\_\_\_.
19. How many unpaired electrons are there in a Bromine ion?
20. Which color of visible light has the 2<sup>nd</sup> shortest wavelength?
21. What types of atomic orbitals are in the 4<sup>th</sup> principal energy level.
22. If there was a 8<sup>th</sup> principal energy level what would be the maximum number of electrons it could hold?
23. Energy needed to move an electron from one energy level to another?
24. What is the maximum number of f orbitals in a principal energy level?
25. List the colors of the visible spectrum in order of increasing wavelength.
26. Use a diagram to illustrate wavelength, amplitude, and wave cycle.
27. Explain why the 3d sublevel fills before the 4p sublevel begins to fill as electrons are added.
28. Explain how Iron can have more than one possible electron configuration.