

## Bohr Model of the Atom - Assignment

1. Draw a fully labeled diagram of the Bohr Model of the atom for hydrogen. Label the nucleus and the allowed Bohr orbits from  $n=1$  to  $n=5$ . Indicate the charge on the nucleus. Add an electron to the diagram and label the electron and state its charge. Place this electron in the "GROUND STATE" Place your labels to the right as per the instructions in the combustion of magnesium lab report. Make your diagram at least one third of a page. (6 marks)
2. Why is the ground state the preferred location for the electron? (2 marks)
3. Why is energy required to excite the electron from the ground state? What three forms of energy can be used to excite the electron from the ground state. (4 marks)
4. Give definitions for:
  - a) outwards transition (give an example)
  - b) inwards transition (give an example)
  - c) photon
  - d) wavelength of photon
  - e) frequency of photon
  - f) energy of photonYour definitions should be short and concise. (8 marks)
5. Why do elements produce a line spectra when excited by heat, light or electricity. (5 marks)
6. Draw an electromagnetic spectrum including all classes of electromagnetic radiation from radiowaves to gamma rays. Add to this spectrum a colours as seen in the visible portion of the spectrum. Under your spectrum indicate the relationships of energy, frequency and wavelength to the spectrum that you have drawn. (9 marks)
7. Using the link on the webpage, look up helium in the table at the bottom. Click on the "helium.txt" link. This will give you numerical information on helium. Answer these question:
  - a) how many lines have been detected
  - b) which line in the brightest and how do you know
  - c) why is the brightest line the brightest
  - d) give two reasons why you were not able to detect all of these lines in class.(marks 6)
8. Why do different elements produce different line spectra (i.e. spectral fingerprint?) (2 marks)
9. How can line spectra be used to deduce the elemental composition of distant stars? What element was first identified on a distant star. (3 marks)

Include spectral drawings as FRONT PAGE (10 marks)

Sentence structure, answers style and spacing (5 marks)