Electron Arrangement & EMR Waves Lab Notes & Analysis

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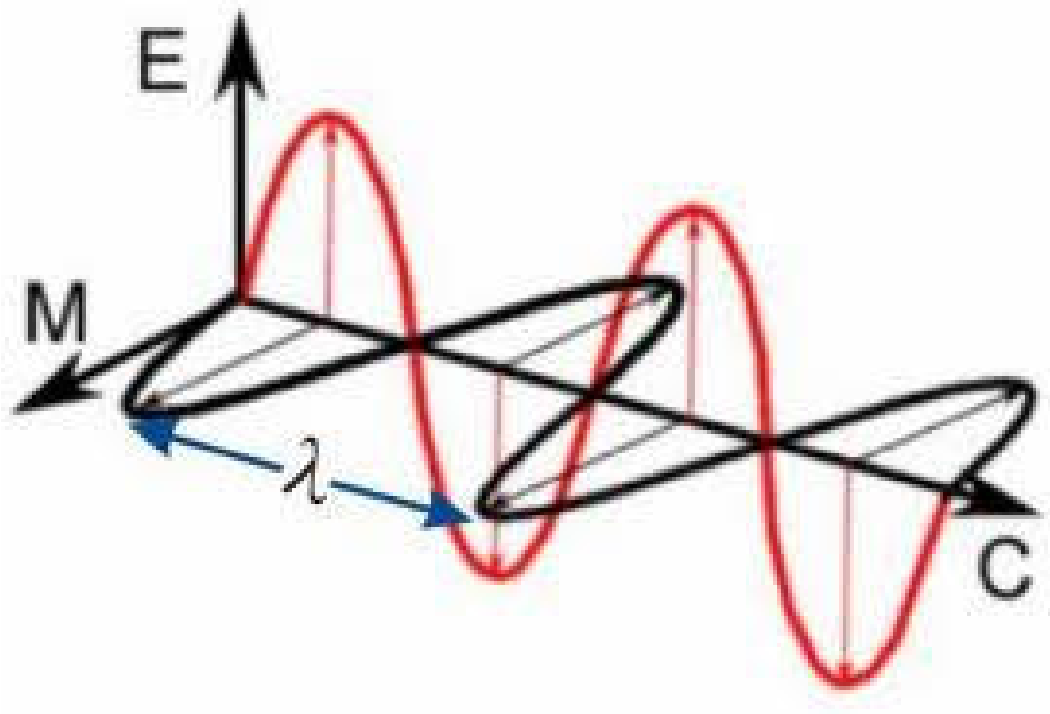
image credit cps-amu



History

In Atomic Physics lived one of the greatest thinkers in the field Niels Bohr. He reinstated Democritus's atomic theory and built Planck's Quantum Theory into a scientific model on what is today called the Bohr Model or the Atomic Shell Model. He set out the idea of a positively charge nucleus surrounded by electrons that are able to create electrostatic forces. This led to the full reflown theory of an atom having an atomic shell and that it is included in all forms of life. Later, due to deep collaboration with its relation to the Sommerfield-Theory, the theory became renamed as the Bohr-Sommerfield Theory in 1913, just two years after Rutherford's model. The difference is that Bohr's model introduced atoms as having many rings rather then just one; this was known as perhaps one of the greatest discoveries of the 20th century.

Around the same time Bohr was working on his scientific findings, a scientist and colleague in the same field, was working on the discover of Electromagnetic Radiation Waves or EMR waves. His name was James Clerk Maxwell. Maxwell's equation also included that light itself is an EMR Wave. Maxwell also concluded that these waves coinciding with electrostatic forces would create an electromagnetic field. His theory was proved correct by Heinrich Herz as well as the rest of the scientific community.

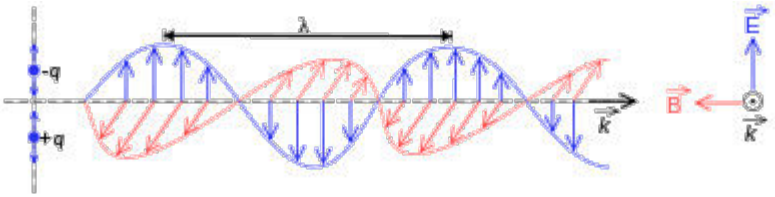


Image Credit: wiki images

Spectrum Lab and Testing Application in Relation to Chemistry

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Part 1: Flame Test:

Known Element 1: Barium: Green

Known Element 2: Calcium: Red

Known Element 3: Sodium Yellow

Known Element 4: Rubidium: Purple

Known Element 5: Potassium: Blue

Known Element 6: Lithium: Violet

Unknown 1: Yellow: Concludes that it must be Sodium

Unknown 2: Blue: Conclude that it must be Potassium

PART II - SPECTROSCOPY						
	HYDROGEN	HELIUM	SODIUM	NEON	MERCURY	STAR
1	Purple, 410nm	Purple, 400nm	Purple, 400nm	Purple, 400nm	Purple, 400nm	Purple, 410nm
2	Blue, 440nm	Purple, 420nm	Blue, 450nm	Blue, 420nm	Blue, 430nm	Purple, 420nm
3	Blue, 500nm	Blue, 450nm	Green, 500nm	Blue, 430nm	Blue, 450nm	Blue, 430nm
4	Green, 510nm	Blue, 450nm	Green, 550nm	Light Blue, 500nm	Light Blue, 500nm	Teal-Blue, 500nm
5	Yellow Green, 540n	Green, 510nm	Yellow, 580nm	Teal, 515nm	Green, 540nm	Green, 550nm
6	Yellow Green, 560n	Green, 560nm	Yellow, 590nm	Green, 520nm	Teal, 550nm	Yellow, 585nm
7	Yellow, 570nm	Yellow, 590nm	Orange, 600nm	Green, 525nm	Yellow, 568nm	Orange, 635nm
8	Orange, 600nm	Orange, 610nm	Orange, 630nm	Green, 570nm	Orange, 610nm	Red, 700nm
9	Red, 660nm	Red, 690nm	Red, 660nm	Yellow, 580nm	Red, 690nm	Red, 710nm
10	Red, 700nm	Dark Red, 750nm	Red, 720nm	Red, 740nm	Red, 700nm	Red, 730nm

Conclusion:

*Different Element produce different colors of light when heated are because of their different chemical and physical properties leaving the chemical reaction different each time.

*Element must be heated to produce emitted light, this is due to its chemical reaction caused by absorbed energy, which is required in order to emit light. This is why elements acquire being heated in order to emit light. Sometimes absorbed energy can cause electromagnetic radiation, also these spectrums are different waves of lights due to the different energy levels of a chemical reaction.

* Due to less similarities between the colors found in hydrogen and the colors found in Hydrogen, you can tell that the most abundent element in a star is obviously Hydrogen.

*The pattern of wavelengths to spectrum is measured as: $\nabla^2 \mathbf{B} = \mu_0 \epsilon_0 \frac{\partial^2 \mathbf{B}}{\partial t^2}.$

Sources:

^^http://flvsweb.gennet.us/mrnyhb/module02/02_05c_a.htm^^Module Lab in Spectroscopy

^ ***a b c*** Binhi, Vladimir N; Repiev, A & Edelev, M (translators from Russian) (2002). *Magnetobiology: Underlying Physical Problems*. San Diego: Academic Press. pp. 1–16. ISBN 978-0-12-100071-4. OCLC 49700531.

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