

Laboratory: Atomic Spectra

Name: _____

Block: _____ Date: _____

Partner's Name: _____

Data

Spectrum of sunlight

700 nm		600 nm		500 nm		400 nm	

Spectrum of candle light

700 nm		600 nm		500 nm		400 nm	

Spectrum of ceiling light

700 nm		600 nm		500 nm		400 nm	

Line spectrum of Hydrogen

700 nm		600 nm		500 nm		400 nm	

Line spectrum of Helium

700 nm		600 nm		500 nm		400 nm	

Line spectrum of Mystery Element = _____

Post-activity Questions

1. Describe a continuous spectrum. List all the sources that gave a continuous spectrum.

2. Describe a line spectrum. List all the sources that gave a line spectrum.

3. When the lamp for the gas filled bulb was turned on, why did it light up? Be sure to use these terms: electron, energy, ground state, excited state

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4. What is a photon and how does it relate to the line spectra of elements?

5. What do the unique line spectra suggest about the electron arrangement of atoms of various elements?

6. Below are wavelengths (in nm) of light emitted by Hydrogen.
In the UV range (called the Lyman series, emission to $n=1$): 93, 94, 95, 97, 102, 121 nm
In the VIS range (called the Balmer series, emission to $n=2$): 397, 410, 434, 486, 656 nm
In the IR range (called the Paschen series, emission to $n=3$): 1005, 1093, 1281, 1875 nm

a. Sketch where the lines would appear on the nanometer scale shown below.

0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	

b. For the first line in each series, calculate the frequency in Hz.

c. For the first line in each series, calculate the energy in kJ/mol.