1) Review of Electron Transitions

- An atom has regions in space called "shells." A shell is like the surface of a hollow ball.
- An atom will not remain excited. It will lose energy in the form of light when the electron returns to the lowest energy level.

7500

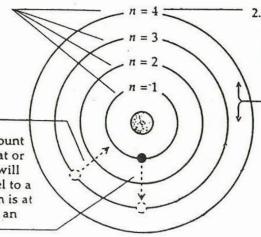
7000

6500

wavelengths of light

6000

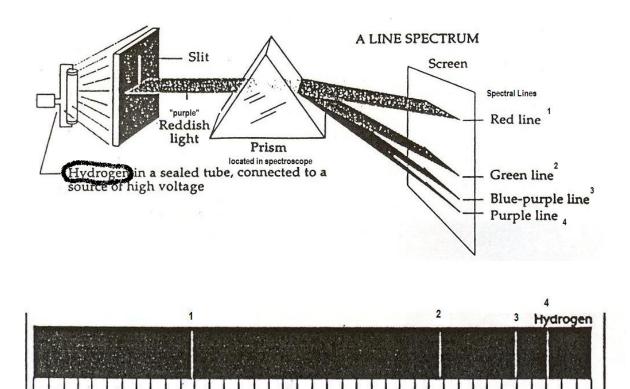
5. If an atom absorbs the right amount of energy (from a source of heat or an electric spark), its electron will jump from a lower energy level to a higher level. When the electron is at the higher level, the atom is in an excited state.



- 2. Shells, or energy levels, are numbered by size. The level in which the electron has the smallest amount of energy is the first energy level (n = 1).
 - 3. The electron can move about the atom only at certain energy levels. It cannot move at any other levels. It cannot move here.
 - 4. The electron normally moves about the atom in the smallest shell, that is, at the lowest energy level, n = 1. When the electron is at the lowest level, the atom is in the ground state.

2) Like the light in our classroom, the light emitted by an excited element is a mixture of colors that can be separated with a **spectroscope**. Refer to Handout with Spectral Chart.

Demo: spectral glasses, spectroscope, BLS Chart



5500

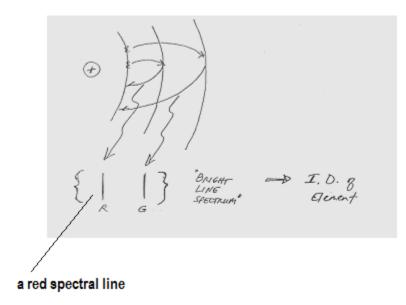
Å (10⁻¹⁰ m)

5000

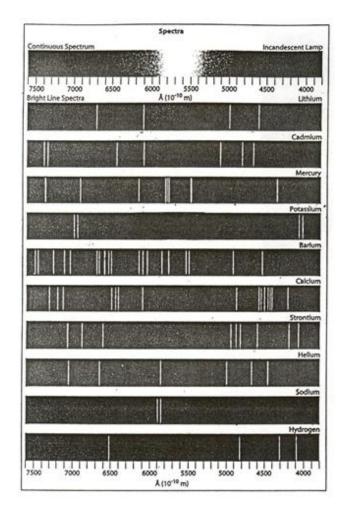
4500

4000

3) An element can produce more than one colored spectral line because there can be more than one possible electron jump in the atoms of that element.



4) Since no two elements have the same Bright Line Spectrum, spectra can be used to identify elements.



OK, let's do some problems.

Nan	lariae:	6028 - 1 - Page 1
1)	When compared with the energy of an electron in the first she a carbon atom is	ell) f a carbon atom, the energy of an electron in the second shell of
	A) the same B) less	S greater
	Distance For Nucleu	S APPERENDE 0-
2)	An electron in an atom moves from the ground state to an exe	ited state when the energy of the electron
	A) remains the same (B) increases	C) decreases
3)) Compared to an atom of hydrogen in the ground state, an ato	m of hydrogen in the excited state has
	A) both released and absorbed energy	C absorbed energy, only
	B) released energy, only	D) neither released nor absorbed energy
	ut 4	
4)) Which electron transition represents a gain of energy	
	A) from 3rd to 1st shell	from 2nd to 3rd shell
	B) from 3rd to 2nd shell	D) from 2nd to 1st shell
5)) When the electrons of ar excited itom return to a lower energy	gy state, the energy emitted can result in the production of
	A) protons B) isotopes	S spectra D) alpha particles
-		Kight
		Right photons

The diagram below shows bright-line spectra of selected elements.



4) Identify the two elements in the given unknown spectrum.

H& He

5) Explain how a bright-line spectrum is produced in terms of excited state, energy transitions, and ground state.

Light is emitted when an e- Jumps from the excited state to the ground state.

Questions 4 and 5 refer to the following: