

## Title: Emission and Absorption Spectra

Absorption Spectroscopy Site

Emission Spectroscopy site

Line Spectroscopy Site

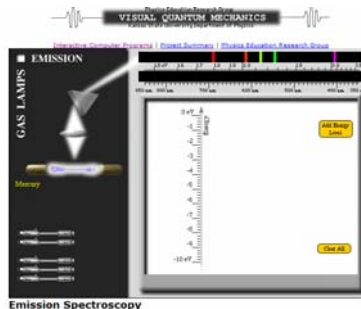
### Purpose:

- To observe the absorption and emission spectra of selected elements

### Procedure:

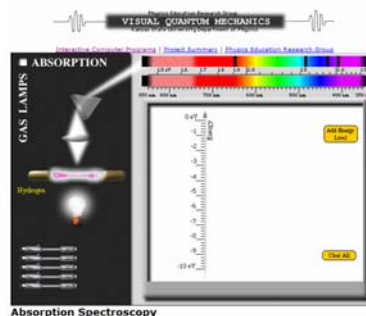
#### Activity 1

- Go to the Absorption Spectra Site  
<http://phys.educ.ksu.edu/vqm/html/absorption.html>
- Follow the directions for
  - observing the actual spectrum of a gas.
  - creating and manipulating energy levels.
  - creating transitions between energy levels.
  - matching trial spectral lines to those of the actual spectrum
  - identifying an unknown gas
- Record your results in Data Table 1



#### Activity 2:

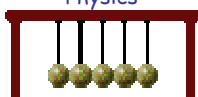
- Go to the Emission Spectra Site  
<http://phys.educ.ksu.edu/vqm/html/emission.html>
- Follow the directions for
  - observing the actual spectrum of a gas
  - creating and manipulating energy levels
  - creating transitions between energy levels
  - matching trial spectral lines to those of the actual spectrum
  - identifying an unknown gas
- Record your results in Data Table 2



#### Activity 3

- Go to Line Spectra Site  
<http://webmineral.com/help/FlameTest.shtml>
- Record the following data for the elements listed in Data Table 3.
  - flame test color
  - approximate numbers of lines of each color
- Click the Flame Spectrum Pop-Up button.
  - Compare the flame and spark emission spectra.
  - Record in Data Table 3.

Color	Shade or Tone	Element	Remarks
Red	Crimson	Li	The lithium minerals, which are either silicates or phosphates, do not become alkaline after ignition. Compare strontium.
Red	Crimson	Sr	Carbonates and sulfates show the strontium reaction, and become alkaline after ignition. Silicates and phosphates do not give the strontium flame.
Red	Yellowish to orange	Ca	Only a few minerals give this calcium color decisively when heated alone. Often, however, the color shows distinctly after moistening the assay with hydrochloric acid.



**Results:**

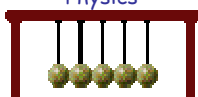
Data Table 1: Absorption Spectra for Selected Elements						
Element	Approximate Number of Lines					
	violet	blue	green	yellow	orange	red
hydrogen						
helium						
mercury						
lithium						
neon						
unknown =						

Data Table 2: Emission Spectra for Selected Elements						
Element	Approximate Number of Lines					
	violet	blue	green	yellow	orange	red
hydrogen						
helium						
mercury						
lithium						
neon						
unknown =						



Data Table 3: Absorption Spectra for Selected Elements

Element	Flame Test Color	Approximate Number of Lines						Flame and Spark Spectra
		violet	blue	green	yellow	orange	red	same or different ?
Li								
Sr								
Ca								
Na								
Ba								
Mo								
B								
Tl								
P								
Zn								
Te								
Sb								
Pb								
Cu								
Se								
In								
As								
K								
Rb								
Cs								



**Discussion:**

1. Summarize what you did.
2. Compare and contrast the emission and absorption spectra for hydrogen, helium, mercury, lithium, neon.
3. Describe what happens to the spectra when you
  - a. create and manipulate energy levels.
  - b. create transitions between energy levels.
4. How successful were you in matching trial spectral lines to those of the actual spectrum?
5. Describe any patterns in spectral lines that you noted.

**Conclusion:**

*A brief testable statement about emission and absorption lines, based on your data*

**Reflection:**

Personal statement

