

MINILAB

2.2

Line Emission Spectra

How can you observe and compare emission spectra of white light and several elements?

Emission spectra of elements result from of electron transitions within atoms. They provide information about the arrangements of electrons in the atoms.

PROCEDURE



1. Read and complete the lab safety form.
2. Observe the emitted light from an incandescent bulb through a diffraction grating as you hold it close to your eye. Hold the grating by the cardboard edge and avoid touching the transparent material that encloses the diffraction grating. Record your observations.
3. Next, observe the light produced by the spectrum tube containing hydrogen gas and record your observations. It may be necessary for you to move to within a meter of the spectrum tube in order to effectively observe the emission spectrum. **WARNING: The spectrum tube operates at a high voltage. Under no circumstances should you touch the spectrum tube or any part of the transformer.**
4. Repeat step 2 with other spectrum tubes as your teacher designates.

ANALYSIS

1. **Explain** Why do only certain colors appear in the emission spectra of the elements?

2. **Infer** If each hydrogen atom contains only one electron, how are several emission spectral lines possible?

3. **Interpet** Why do other elements emit many more spectral lines than hydrogen atoms?
