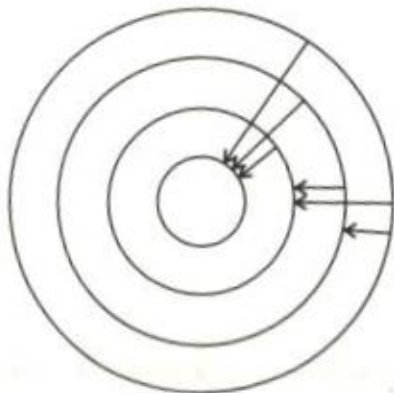


Spectrum Tube
H₂

Instruction Manual

GENERAL SPECIFICATIONS:

Spectrum Tubes contain one or more elements as gaseous atoms or molecules. Energy is supplied through an electric field applied between electrodes at the ends of the tubes. Ions and electrons formed by the field are accelerated; collisions convert the increased Kinetic energy to other types, one being electronic. Electrons in energetic or excited atoms occupy one of many well-defined states. An electron with high energy E_3 will return to a lower energy state E_2 , simultaneously emitting a photon of energy $E_3 - E_2 = \Delta E = hc/\lambda$; where $h = 6.63 \times 10^{-34}$ J-s is Planck's constant, $c = 3 \times 10^8$ m/s is the speed of light and λ is the wavelength of light (in meters) in the emitted photon.



Each excited atom type emits characteristic wavelength determined by energy level differences ΔE present in that species. One may observe a particular color with the eye; analysis with a spectrometer will reveal a series of sharp (monochromatic) emission lines.

OBSERVING THE SPECTRA:

These Spectrum Tubes use research-grade gasses and vapors to provide bright-line spectral lines of the highest clarity. They are designed for optimum intensity and line resolution when examined in a student grade spectrometer equipped with a ca. 200 line/mm (5000 line/inch) diffraction grating.

The pressure of the various gasses in spectrum tubes is a carefully controlled value that will produce the maximum quality of brightness and clarity of the spectral lines.

For some tubes it is not necessarily the same value of pressure that produces maximum continuous operating life of the spectral lines. Tubes should be energized with the Spectrum Tube Power Supply, Which is made expressly for this purpose. Tube life is extended if operation is cyclic for no more than 30 seconds "on", 30 seconds "off" etc., increasing the usable life of the tubes.

Some tubes using neon, helium and other gases found in cold cathode display sign can run continuously with less deterioration of the quality of the spectral lines. The others, such as hydrogen, the halogens and water vapor, require more care in processing to increase the life. Pure nickel electrodes and the best research grade of gases are used, and meticulous care is taken in processing to increase service life.

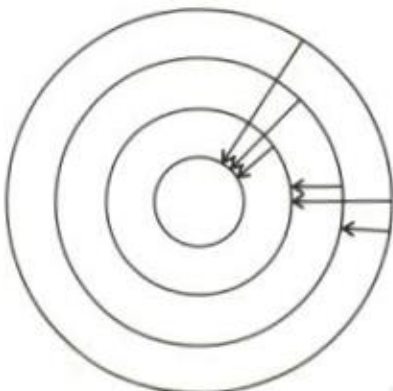
DESCRIPTION OF SPECTRA:

Strong violet, blue and red lines are obvious, although others may be seen.

Color	Wavelength, Å
Violet	4200
Violet	4400
Blue	4900
Red	6700
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