

Paper chromatography



**ASSIGN
BUSTER**

INTRODUCTION MATERIALS**PROCEDURE**

Calibration of the Spectroscope: Using the spectroscope the four most visible lines on the scale were measured. Violet, blue, green, and yellow were all visible. With the ink pen, the measurements were recorded. A known wavelength (nm) vs. measured lines (cm) graph was then drawn from the measurements.

Observation and Measurements of the Hydrogen Spectrum: Using the calibrated spectroscope the scale position of the observable lines of the hydrogen emission spectrum was measured. Red, turquoise, violet, and purple were all visible. Using the measurements and the calibration graph the wavelength of the lines was determined.

The relative error was calculated using: Accepted Value Values of wavelength for the hydrogen atom spectrum were converted to kJ/mol. Using a form of the Rydberg equation, the Rydberg constant was calculated for each of the lines measured. This constant was used to then calculate the percentage error. Data Calibration of the Spectroscope Observations and Measurements of the Hydrogen Spectrum.

CALCULATIONS

(Convert wavelength values to corresponding energy in kJ/mol) $680 \times 10^{-9} \times 2.92 \times 10^{-19} \text{ J} \times (6.022 \times 10^{23}) / (1000 \text{ J}) = 176 \text{ kJ/mol}$ (Calculate the value of the Rydberg constant) $(1/680) / (.25 - .30) = .00147059 / (.25000 - .30)$

$11111) = 0.0105042 \times 10^{-7} = R_h = 105,040 \text{ cm}^{-1}$ (Calculate Percentage Error) $105040 - 109678 \times 100 = 4.23\%$