

Work each of the following problems. SHOW ALL WORK.

1. Hydrogen produces the following atomic emission spectral lines:

410.1 nm

434.0 nm

486.1 nm

656.2 nm

For each of these wavelengths, determine the corresponding frequency.

2. Based on what you know about the Doppler effect, if the atomic emission spectrum of a star had the following spectral lines, what direction would the star be moving relative to the telescope?

414 nm

438 nm

491 nm

663 nm

3. Neon has many atomic emission spectral lines in the orange and red areas of the visible spectrum. What does this indicate to you about the differences between the energy levels of neon's electrons?
