Federal University of Santa Catarina (UFSC)
Joinville Technological Center (CTJ)
Graduate Program in Engineering and Mechanical Sciences (Pós-ECM)

Course: Plasmas and Electrical Discharges in Gases (ECM410054)
Professor: Diego A. Duarte

Atomic structure (List 2)

1. What is the diameter of the hydrogen atom at its three lowest energy levels?

2. Calculate the velocity of the electron in the H-atom, assuming a circular orbit.

3. Find the first five wavelengths of the Paschen series.

4. What is the wavelength and energy in eV of a photon that is emitted from a hydrogen atom as it undergoes a transition from the state n = 10 to n = 1.

5. Evaluate numerically the short and long wavelength limits of the radiation emitted by hydrogen for:
    a. the Lyman series
    b. the Balmer series

6. The visible spectrum extends from about 380 nm to 770 nm. Express the limits in terms of the corresponding photon energy in eV.

7. Determine the frequencies of the first eight transitions in the Lyman series as well as the limiting frequency.