The Bohr Model I

Introduction
- The view of the atom at this point (Rutherford/nuclear model) is that it:
  - Contains a tiny nucleus
  - The electrons move about the nucleus in some unknown way

Recall that the nucleus accounts for almost all of an atom’s mass
- \( p = 0n \approx 1 \text{ amu} \)
- \( e \approx 0 \text{ amu} \)
- If a nucleus were enlarged to the size of 1 green pea, it would have a mass of 250 million tons!

Line Spectra
- The spectrum of visible light consists of a continuous range of colors – a continuous spectrum
- ‘Normal’ light bulbs produce a continuous spectrum of light
- Not all light sources produce a continuous spectrum
Line Spectra

- When *gases* of *pure elements* are placed in a tube and a high voltage is applied, the gases emit light
- When this light is passed through a prism, only certain *frequencies* are seen in the spectrum – a *discontinuous spectrum*
Line Spectra

- Every element has a characteristic *line spectrum*, which is as unique as a fingerprint.

- Question: how can we know the exact chemical composition of the Sun if we’ve never been there?

Flame tests

1. Add a chemical substance to a flame.
2. Send light from the flame through a narrow slit, then through a prism.
3. Bright lines in the spectrum show that the substance emits light at specific wavelengths only.

Continuous Spectrum

Emission Spectrum