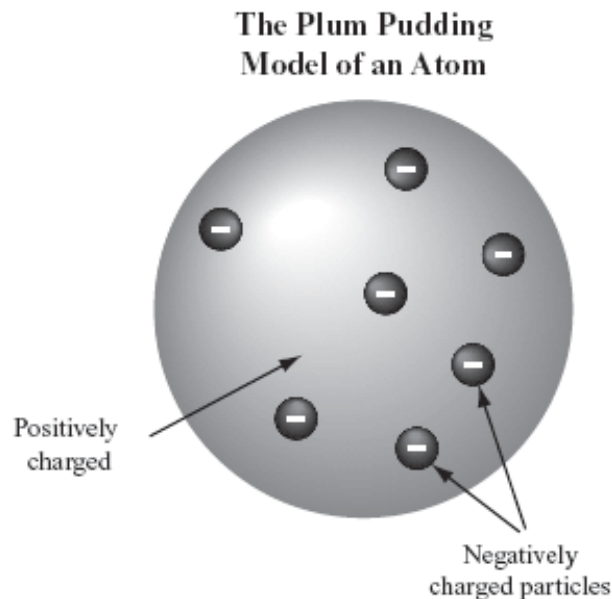


5. J.J Thomson:

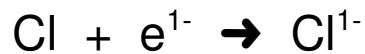
- performed experiments that lead to the discover of a negative subatomic particle that he called an electron (1897)
- experimentation using cathode ray tubes indicated that all matter is capable of producing negative charge particles (called electrons)
- stated that all atoms must contain negative electrons
- problem is that matter is neutral
- hence the plum pudding model (raisin bun model, chocolate chip cookie model)



- atoms are hard positive spheres (amount of positive

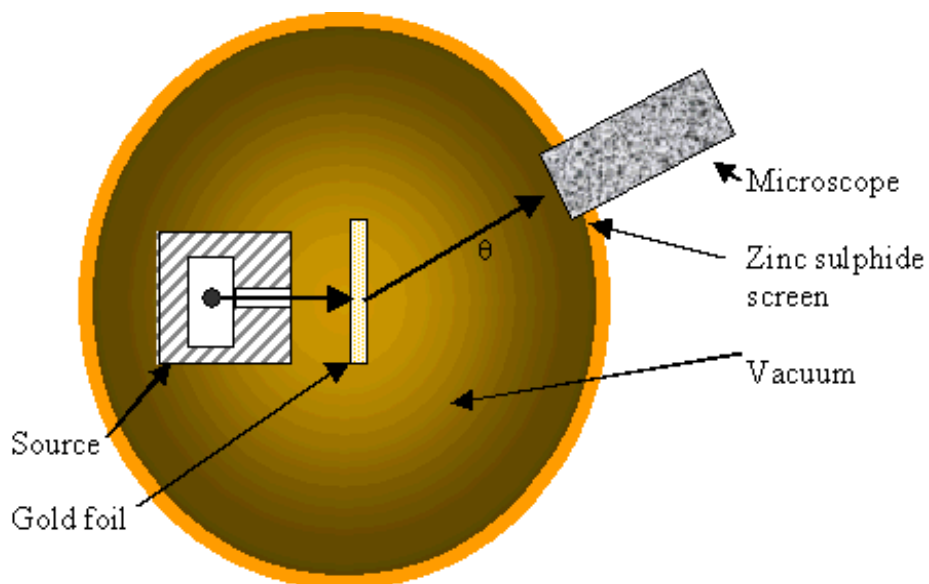
charge depends on the element) with negative electrons attached or embedded in the sphere

- the charge of the sphere and the electrons cancel to make most matter neutral
- can explain ionic charges

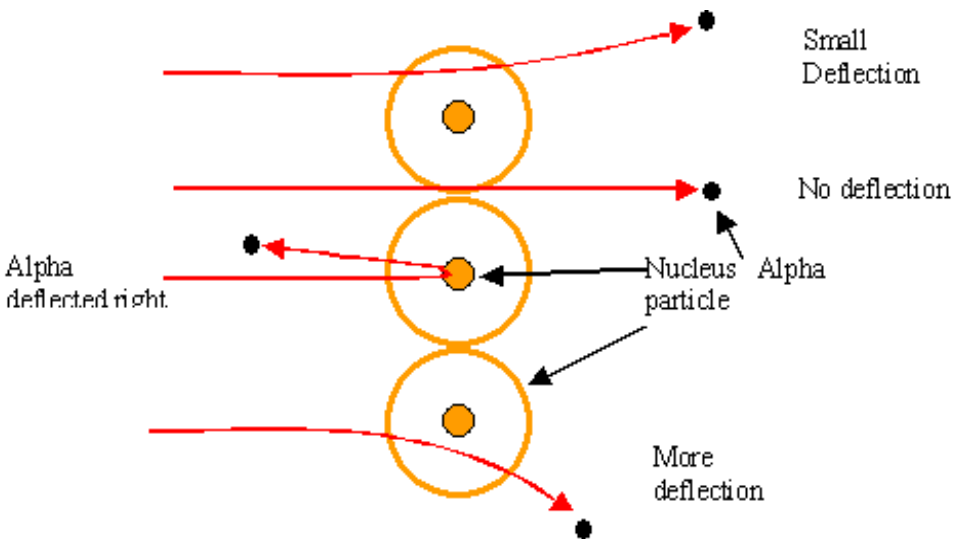


6. Ernst Rutherford:

- famous gold foil scattering experiment
- bombarded very thin gold foil (100 atoms thick) with alpha particles from a radioactive source (fast moving positive helium nuclei)

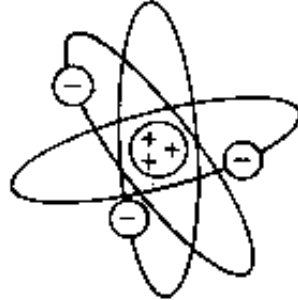


- using the above apparatus Rutherford noted that 99.0% of alpha particles pass straight through the gold foil as if it was not even there (bright green glow directly opposite the alpha particle source)
- gold also cause occasional flashes indicated reflected and deflected alpha particles



- atoms are mostly empty space (alpha particle pass straight through)
- atoms contain a small dense positively charge nucleus at their center (cause 1% of alpha particle to reflect or deflect)

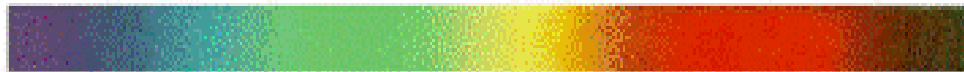
- suggested that electrons orbit the positive nucleus not unlike a planetary system



- problems:
 - how do the electrons orbit?
 - why don't electrons fall into the nucleus?
 - and what about those line spectra??
 - Rutherford said "I don't know"

Aside: Line Spectra: When a pure element is excited by heat, electricity or the right type of light a unique line spectra is observed. Every elements line spectra is different and is often called the elements spectral fingerprint.

Continuous Spectra



Elemental Line Spectra

