

- 1) What property of electrons (“cathode rays”) did Thomson determine? charge/mass ratio
- 2) How did Thomson know that electrons had a much lower mass than H atoms?
Their deflection, which depends on q/m , in the CRT was much larger than observed for charged H atoms, known to be the lightest element.
- 3) Describe JJ. Thomson’s model of the atom.
In the Plum Pudding model, the electrons were particles of negative charge evenly distributed throughout a matrix of evenly distributed positive charge of equal amount to the negative charge.
- 4) In the gold foil experiment, why had Rutherford predicted that all of the alpha particles should go straight through the gold foil?
According to the Plum Pudding model, the charge and mass of the atom should have been evenly distributed, so there would have been nothing to deflect the alpha particles passing through it.
- 5) Why did most of the alpha particles go straight through the foil and a small number were deflected? (Must answer both parts!)
The atom is mostly “empty” space with nothing for the alpha particles to collide with, so almost all went straight through. However, about 1 in 10,000 particles collided with and were deflected by the positively charged, very small, massive, dense nucleus, which is about 1×10^{-5} \times the diameter of the atom.