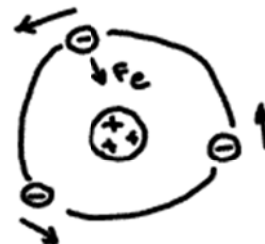
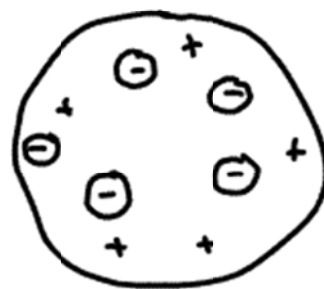


AP Physics - Modern Physics - History of the Atom

Note Title

4/14/2008

Approx. Date	Person	Challenge of Previous Model	Proposed New Model
~400 BC	Democritus (Greece)	"Everything is one" - Democritus thought this was silly	All substances are made of indivisible particles called "atoms"
1890s	J.J. Thomson	Atoms seemed capable of ejecting negatively charged particles (photoelectric effect)	"Plum Pudding": Atoms consist of positive "goo" containing negative electron "plums"
1911	E. Rutherford	When alpha particles (doubly-ionized He nuclei) were shot at gold foil, most passed straight through, while a few were highly deflected	"Planetary" Model: Alpha particles (+ charge) must be bouncing off of very tiny, yet massive, positively charged nuclei. Electrons must be held in orbit around nucleus because of electrostatic attraction.



1913 N. Bohr

Classical theory says that for an electron to be orbiting, it must have a centripetal acceleration, and that if it is accelerating it must be giving off EM (light) waves, and that if it is giving off EM waves, then it must be losing energy, and if it is losing energy, then it will eventually spiral in and collide with the nucleus

→ Rutherford's model predicts that all atoms are unstable!

Bohr Model:
Only certain electron radii are stable, in accordance with quantum theory.

