

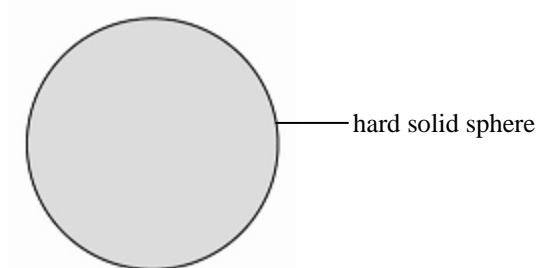
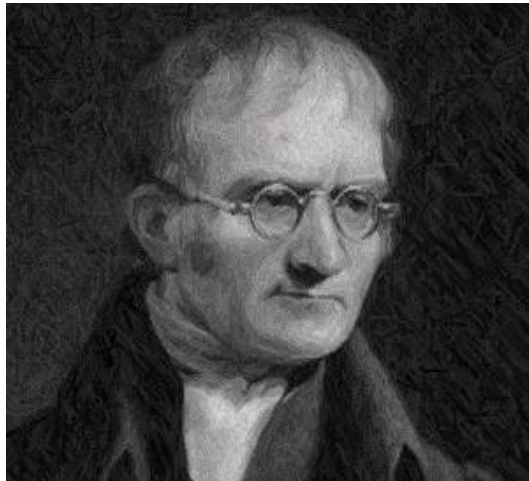
CHAPTER 4: MATTER AND SUBSTANCE

Graphic on the Development of the Atom

Although an atom is so tiny, scientists now have a very good picture of the structure of an atom. But this knowledge has been slowly and patiently developed over the years.

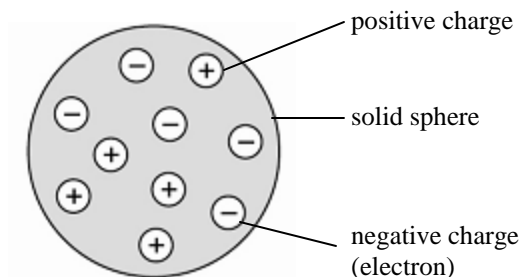
John Dalton

The atom is a hard solid sphere. The atom cannot be created or destroyed.



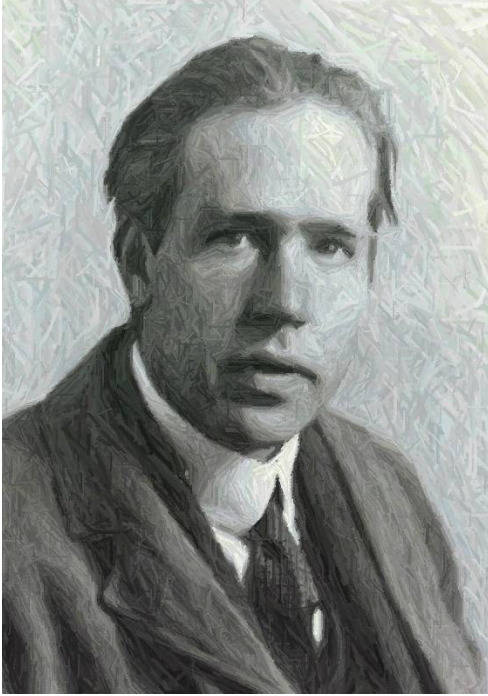
J.J. Thomson

The atom is a solid sphere that consists of positively charged solid matter. Negative charges (electrons) are embedded in it. On the whole an atom is neutral.

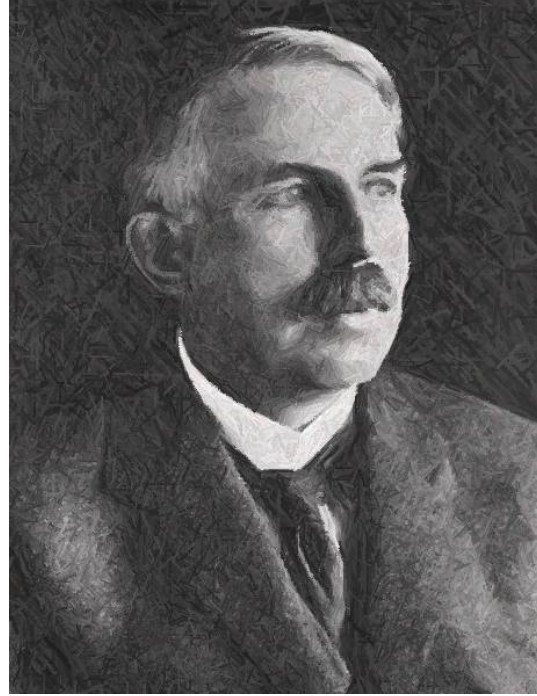


Bohr Rutherford

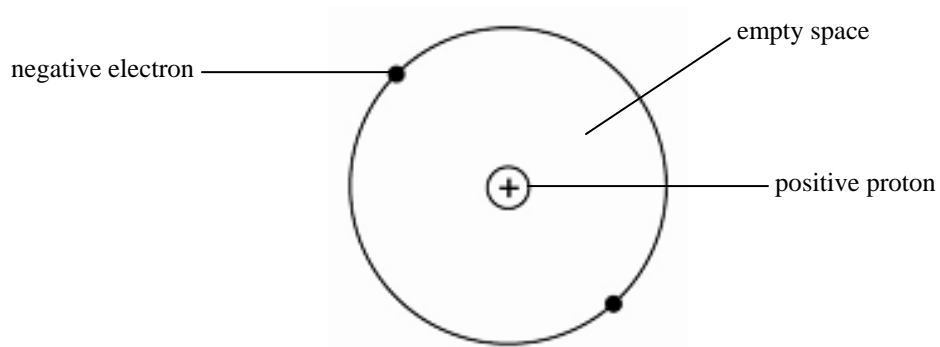
The atom is like a 'solar system'. It has a positively charged nucleus containing protons with negatively charged electrons orbiting a nuclear 'sun'. Most of the atom is empty space.



Niels Bohr

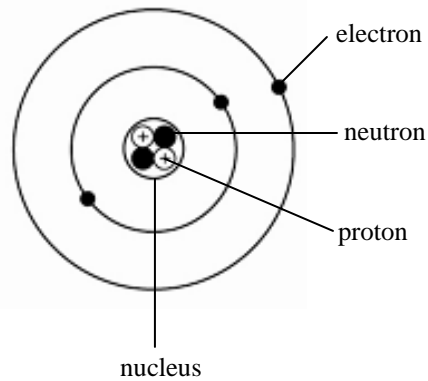
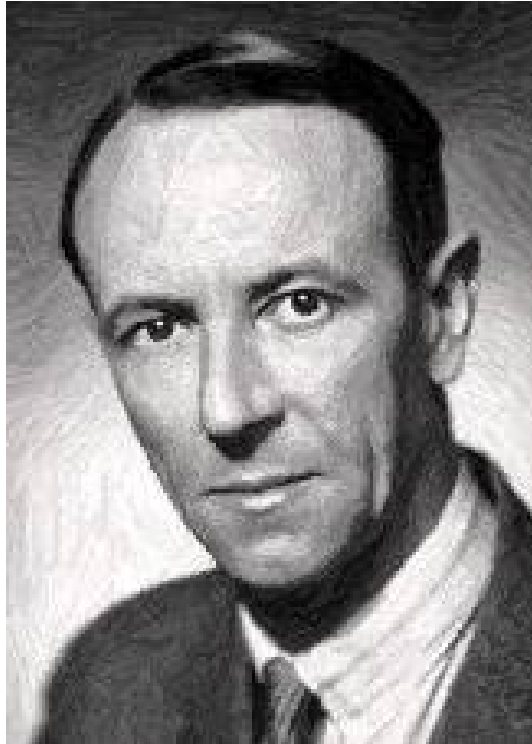


Ernest Rutherford



James Chadwick

The atom has a nucleus built up from positively charged protons and neutral neutrons. Negatively charged electrons orbit the nucleus in their own shells.



Present day

The atom has a nucleus built up from protons, neutrons and other subatomic particles. Negatively charged electrons orbit the nucleus in their own shells.

