

OR notes Entry 21

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A HISTORY OF THE ATOM: THEORIES AND MODELS

How have our ideas about atoms changed over the years? This graphic looks at atomic models and how they developed.



JOHN DALTON
1803

Dalton drew upon the ancient Greek idea of atoms (the word 'atom' comes from the Greek 'atomos' meaning indivisible). His theory stated that atoms are indivisible, those of a given element are identical, and compounds are combinations of different types of atoms.



J.J. THOMSON
1904

Thomson discovered electrons (which he called 'corpuscles') in 1897, for which he won a Nobel Prize. He subsequently produced the 'plum pudding' model of the atom. It shows the atom as composed of electrons scattered throughout a spherical cloud of positive charge.



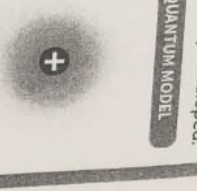
ERNEST RUTHERFORD
1911

Rutherford fired positively charged alpha particles at a thin sheet of gold foil. Most passed through with little deflection, but some deflected at large angles. This was only possible if the atom had a positive charge concentrated in the centre - the nucleus.



NIELS BOHR
1913

Bohr modified Rutherford's model of the atom by stating that electrons moved around the nucleus in orbits of fixed sizes and energies. Electron energy in this model was quantised; electrons could not occupy values in between the fixed energy levels.



ERWIN SCHRÖDINGER
1926

Schrödinger stated that electrons do not move in set paths around the nucleus, but in waves. It is impossible to know the exact location of the electrons; instead, we have clouds of probability or more precisely, orbitals, in which a more likely to find an electron.

+ RECOGNISED ATOMS OF A PARTICULAR ELEMENT DIFFER FROM OTHER ELEMENTS

+ RECOGNISED ELECTRONS AS CORPUSCLES OF MATTER

+ REALISED POSITIVE CHARGE WAS LOCATED IN THE NUCLEUS OF AN ATOM

+ PROPOSED STABLE ELECTRON ORBITS, EXPLORED THE EMERGENCE OF SOME ELEMENTS

+ SHOWED ELECTRONS DON'T MOVE ALONG SET PATHS AROUND THE NUCLEUS, BUT IN WAVES



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