



Division of the History of Chemistry  
American Chemical Society

## Citation for Chemical Breakthrough

On the Structure of the Atom



*E. Rutherford, Philosophical Magazine, 1911,  
21 [Series 6], 669 – 688.*

**LXXIX.** *The Scattering of  $\alpha$  and  $\beta$  Particles by Matter and the Structure of the Atom.* By Professor E. RUTHERFORD, F.R.S., University of Manchester\*.

§ 1. **I**T is well known that the  $\alpha$  and  $\beta$  particles suffer deflexions from their rectilinear paths by encounters with atoms of matter. This scattering is far more marked for the  $\beta$  than for the  $\alpha$  particle on account of the much smaller momentum and energy of the former particle. There seems to be no doubt that such swiftly moving particles pass through the atoms in their path, and that the deflexions observed are due to the strong electric field traversed within the atomic system.



In comparing the theory outlined in this paper with the experimental results, it has been supposed that the atom consists of a central charge supposed concentrated at a point, and that the large single deflexions of the  $\alpha$  and  $\beta$  particles are mainly due to their passage through the strong central field. The effect of the equal and opposite compensating charge supposed distributed uniformly throughout a sphere has been neglected. Some of the evidence in support of these assumptions will now be briefly considered.

Presented to the University of Manchester  
2012