Oil drop experiment

Students will determine the charge of the electron using the Millikan’s oil drop apparatus, they will also determine Avagadro’s number from their data. The charge of the electron will be determined by comparison of the velocity at which a charged oil drop falls under the force of gravity with the upward velocity of the drop in a vertical electric field. The spread of the results obtained for the value of e (due to Brownian motion affecting the time taken to move through a given distance) can be related to Boltzmann’s constant, and through kinetic theory, to Avagadro’s number. Students will then devise an experiment to determine the charge of the electron using the same apparatus, but with a variable voltage supply, enabling them to control the velocity of the drop.