APR13-2013-020055

Abstract for an Invited Paper
for the APR13 Meeting of
the American Physical Society

Moseley Centennial Lecture: The Works of Henry Moseley, 1887-1915

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In 1913 Henry Moseley, an unknown young English physicist published an article in the Philosophical Magazine under the title of "The High Frequency Spectra of the Elements." The 10-page article was to have far reaching implications in both chemistry and physics and helped to resolve a major conundrum in the periodic table of the elements. The talk will briefly examine the life and work of Moseley who died tragically while fighting in the trenches of World War I in 1915. The build-up to the discovery of atomic number took several different avenues including contributions from Rutherford and Barkla. However the more direct motivation for Moseley's work, as he readily acknowledged, were the articles of an unknown Dutch econometrician Anton Van den Broek who attempted to improve on Mendeleev's periodic table. Moseley began as a student of Rutherford at Manchester and took a keen interest in the development of research using X-rays following the work of Roentgen, von Laue and Bragg. Although Rutherford was at first reluctant to enter this new field he soon yielded to young Moseley's request and sent him to Leeds for brief training with Bragg. On returning to Manchester, Moseley devised an ingenious apparatus in which a set of metal samples could be rotated so as to become the target for a beam of electrons in order to measure the frequencies of the emitted K X-rays. The first set of such experiments used nine successive elements in the periodic table, from titanium to zinc. Moseley's now immense fame rests with the results of this study as well as a subsequent one which extended the study into a further 30 elements, in addition to the use that his method was put to by himself as well as subsequent chemists and physicists.