

Abstract Submitted
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Elemental Composition and Concentration of Upstate New York Rainwater Samples Using the Union College Pelletron Particle Accelerator and Proton Induced X-ray Emission (PIXE) Spectroscopy KATIE SCHUFF, SCOTT LABRAKE, MICHAEL VINEYARD, CHARLES HARRINGTON, COLIN GLEASON, Union College — A 1-megavolt tandem electrostatic Pelletron particle accelerator housed at Union College was used to measure the elemental composition and concentration of rain water collected in Schenectady, NY in June 2009. A beam of 2.0-MeV protons was directed at an approximately 12-micrometer thin Mylar film substrate onto which 1.0-mL of concentrated rainwater was dried. The interaction of the incident protons with the target material causes inner shell electrons to be ejected and these vacancies are filled through electronic transitions of higher orbital electrons with the production of x-ray photons characteristic of the elemental composition of the target. This is the PIXE Method. Data on the intensity and energy of x-rays were collected using an Amptek silicon drift detector. Spectra of the number of x-rays collected as a function of energy were analyzed and the elemental composition was found to contain Ca, K, S, Cl, Ti, Cr, Fe, Cu, Zn, & Se(added as an internal standard) with concentrations determined using the analysis package GUPIX.

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