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Micro-Raman Spectroscopy to Complement Proton-Induced X-Ray Emission in the Analysis of Atmospheric Aerosols[1] ALEXANDREA SAFIQ, SALINA ALI, BENJAMIN NADARSKI, JEREMY SMITH, JOSH YOSKOWITZ, SCOTT LABRAKE, MICHAEL VINEYARD, Union College, UNION COLLEGE TEAM — There is an active research program in the Union College Ion-Beam Analysis Laboratory on proton-induced X-ray emission (PIXE) analysis of atmospheric aerosols. PIXE is a powerful tool for the study of airborne pollution because it provides information on a broad range of elements simultaneously, has low detection limits, is nondestructive, does not require large samples, and the analysis can be performed in a short amount of time. However, PIXE provides only elemental information. We are investigating the use of Micro-Raman spectroscopy (MRS) to complement PIXE analysis of aerosol samples by providing chemical information. In MRS, laser light is inelastically scattered from a sample and the vibrational spectrum of the scattered light is used to identify molecules and their functional groups. We are focusing on aerosol samples collected in the Adirondack Mountains that have considerable concentrations of sulfur that may contribute to acid rain. The MRS spectra collected on aerosol samples are being compared with a library of standards to try to determine the molecular structures in which the sulfur is bound. We will describe the analysis and present preliminary results.

[1]Union College Undergraduate Research Program

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