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PIXE Analysis of Artificial Turf SKYE CONLAN, SAJJU CHALISE, ZACHARY PORAT, SCOTT LABRAKE, MICHAEL VINEYARD, Union College — In recent years, there has been debate regarding the use of the crumb rubber infill in artificial turf on high school and college campuses due to the potential presence of heavy metals and carcinogenic chemicals. We performed Proton-Induced X-Ray Emission (PIXE) analysis of artificial turf infill and blade samples collected from high school and college campuses around the Capital District of NYS to search for potentially toxic substances. Crumb rubber pellets were made by mixing 1g of rubber infill and 1g of epoxy. The pellets and the turf blades were bombarded with 2.2 MeV proton beams from a 1.1-MV tandem Pelletron accelerator in the Union College Ion-Beam Analysis Laboratory and x-ray energy spectra were collected with an Amptek silicon drift detector. We analyzed the spectra using GUPIX software to determine the elemental concentrations of the samples. The turf infill showed significant levels of Ti, Fe, Co, Ni, Cu, Zn, Br, and Pb. The highest concentration of Br in the crumb rubber was 1500 100 ppm while the highest detectable amount of Pb concentration was 110 20 ppm. The artificial turf blades showed significant levels of Ti, Fe, and Zn with only the yellow blade showing concentrations of V and Bi.

Skye Conlan
Union College

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