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Neutron activation analysis via nuclear decay kinetics using gamma-ray spectroscopy THOMAS DOMINGO, AARON CHESTER, KRZYSZTOF STAROSTA, JONATHAN WILLIAMS, Simon Fraser Univ — Gamma-ray spectroscopy is a powerful tool used in a variety of fields including nuclear and analytical chemistry, environmental science, and health risk management. At SFU, the Germanium detector for Elemental Analysis and Radiation Studies (GEARS), a low-background shielded high-purity germanium gamma-ray detector, has been used recently in all of the above fields. The current project aims to simultaneously expand the number of applications for which GEARS can be used while enhancing its functionality. A recent addition to the SFU Nuclear Science laboratory is the Thermo Scientific P 385 neutron generator. This device is capable of producing up to 3.65×10^8 neutrons/s providing the capacity for neutron activation analysis, thereby opening a major avenue of research which was previously unavailable at SFU. The isotopes created via neutron activation have a wide range of half-lives. To measure activities of isotopes with short half-lives, a new analog data acquisition system has been installed on GEARS allowing accurate measurements of decay kinetics. This new functionality enables identification and quantification of unknown products of neutron activation. Results from the neutron activation analysis of pure metals and environmental samples will be presented.

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