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A new opportunity: coincident spectroscopy in neutron-deficient actinides OLIVER GOTHE, Department of Chemistry, University of California Berkeley, J.M. GATES, K.E. GREGORICH, Lawrence Berkeley National Laboratory, B. BAARTMAN, Department of Chemistry, University of California Berkeley, P. FALLON, Lawrence Berkeley National Laboratory, N.E. ESKER, J. KWARSICK, Department of Chemistry, University of California Berkeley, A.O. MACHIAVELLI, Lawrence Berkeley National Laboratory, P.R. MUDDER, Department of Chemistry, University of California Berkeley, D.T. OLIVE, G. PANG, J. RISSANEN, Lawrence Berkeley National Laboratory, H. NITSCHE, Department of Chemistry, University of California Berkeley — Due to high γ-ray background rates heavy element production facilities are usually not sensitive to the electron capture decay of neutron deficient actinides. We have developed new capabilities at the Berkeley Gas Filled Separator (BGS) that allow us to study these isotopes. The highly selective and efficient separation of compound nucleus evaporation residue products using the BGS couple with a rapid delivery to a low-background detector facility, opens up many new possibilities for nuclear decay and structure studies in the neutron deficient actinides. The decay of these actinides produces vacancies in the K-shell resulting in x-rays uniquely identifying the Z of the decay products. We present the first results of this new methodology in studying the nuclear structure of fermium-254 by observing the gamma rays in coincidence with fermium x-rays. Coincident gamma-decay spectroscopy gives us a new tool to study the nuclear structure of previously inaccessible systems.

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