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Detailed Spectroscopy of Doubly-magic ^{132}Sn with GRIFFIN

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The region of neutron-rich tin isotopes near mass number 130 is of great interest to nuclear structure. In particular, ^{132}Sn with 50 protons and 82 neutrons is a doubly magic nucleus which provides an essential benchmark for the shell model far from stability. Understanding the structure of this nucleus provides a foundation to understand the single-particle nature of excited states in neighbouring isotopes. With no excited states below 4 MeV, ^{132}Sn can be considered to be the most magic among heavy nuclei. In addition to nuclear structure considerations, isotopes in this region are also relevant to astrophysics, as their decay properties are essential to understanding r-process nucleosynthesis and its role in creating the $A = 130$ abundance peak. The nucleus ^{132}Sn has been studied following the β^- decay of ^{132}In at the ISAC facility at TRIUMF. A beam of ^{132}In was delivered to the GRIFFIN decay station, where 16 HPGe detectors were used to detect gamma rays in addition to 20 plastic scintillators of SCEPTAR for beta-tagging. This powerful combination of tools has allowed for the identification of several weak γ-ray transitions as well as assignment of excited state spins via angular correlations. The experiment was also sensitive to the β-delayed neutron decay of ^{132}In by observing γ rays from ^{131}Sn and ^{131}Sb; this experiment represents the first time in that decay has been measured with γ-rays. Results on the decay of ^{132}In and γ spectroscopy of ^{132}Sn will be discussed.

Author: WHITMORE, K. (Department of Chemistry, Simon Fraser University, Burnaby, BC)

Co-authors: ANDREIOU, C. (Department of Chemistry, Simon Fraser University, Burnaby, BC); BALL, G.C. (TRIUMF, Vancouver, BC); BERNIER, N. (TRIUMF, Vancouver, BC; epartment of Physics and Astronomy, University of British Columbia, Vancouver, BC); BIDAMAN, H. (Department of Physics, University of Guelph, Guelph, ON); BILDSTEIN, V. (Department of Physics, University of Guelph, Guelph, ON); BOWRY, M. (TRIUMF, Vancouver, BC); CROSS, D.S. (Department of Chemistry, Simon Fraser University, Burnaby, BC); DUNLOP, M.R. (Department of Physics, University of Guelph, Guelph, ON); DUNLOP, R. (Department of Physics, University of Guelph, Guelph, ON); GARCIA, F.H. (Department of Chemistry, Simon Fraser University, Burnaby, BC); GARNSWORTHY, A.B. (TRIUMF, Vancouver, BC); GARRETT, P.E. (Department of Physics, University of Guelph, Guelph, ON); HENDERSON, J. (TRIUMF, Vancouver, BC); MEASURES, J. (University of Surrey, Guildford, United Kingdom); OLAIZOLA, B. (TRIUMF, Vancouver, BC); PARK, J. (TRIUMF, Vancouver, BC; Department of Physics and Astronomy, University of British Columbia, Vancouver, BC); PETRACHE, C.M. (Centre de Sciences Nucl\'{e}aire et Sciences de la Mati\'{e}re, CNRS/IN2P3, Universit\'{e} Paris-Saclay, Orsay, France); PORE, J.L. (Department of Chemistry, Simon Fraser University, Burnaby, BC); SMITH, J.K. (Department of Physics, Reed College, Portland, OR); SOUTHALL, D. (University of Waterloo, Waterloo, ON); TICU, M. (Department of Chemistry, Simon Fraser University, Burnaby, BC); TURKO, J. (Department of Physics, University of Guelph, Guelph, ON); ZIDAR, T. (Department of Physics, University of Guelph, Guelph, ON)

Presenter: WHITMORE, K. (Department of Chemistry, Simon Fraser University, Burnaby, BC)

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