

Lawrence Berkeley National Laboratory

Recent Work

Title

Measurement of the $^{208}\text{Pb}(^{55}\text{Mn},n)^{262}\text{Bh}$ excitation function

Permalink

<https://escholarship.org/uc/item/7w402878>

Authors

Folden, C.M.
Gregorich, K.E.
Dullmann, Ch.E.
et al.

Publication Date

2004-11-10

Report LBNL-56626 Abs.

Abstract for Submission to the
229th American Chemical Society National Meeting
San Diego, California
March 13-17, 2005

Prepared November 10, 2004

Measurement of the $^{208}\text{Pb}(^{55}\text{Mn}, n)^{262}\text{Bh}$ Excitation Function

C. M. Folden III,^{1,2} K. E. Gregorich,¹ Ch. E. Düllmann,^{1,2} S. L. Nelson,^{1,2} J. M. Schwantes,^{1,2} R. Sudowe,³ P. M. Zielinski,^{1,2} H. Nitsche,^{1,2} and D. C. Hoffman^{1,2}

¹ Nuclear Science Division, Lawrence Berkeley National Laboratory,
Berkeley, California 94720

² Department of Chemistry, University of California, Berkeley, California
94720

³ Chemical Sciences Division, Lawrence Berkeley National Laboratory,
Berkeley California 94720

The excitation function for the $^{208}\text{Pb}(^{55}\text{Mn}, n)^{262}\text{Bh}$ reaction has been measured for the first time. Using the Berkeley Gas-filled Separator at the Lawrence Berkeley National Laboratory 88-Inch Cyclotron, a total of 33 decay chains attributable to ^{262}Bh were observed at three different projectile energies. The existence of a previously reported alpha-decaying isomeric state was confirmed, although the production of the ground state was favored at all three energies. Additionally, 2 decay chains attributable to ^{261}Bh were observed. The observed cross sections are much larger than those reported for the analogous $^{209}\text{Bi}(^{54}\text{Cr}, n)^{262}\text{Bh}$ reaction, suggesting that in the latter case the projectile energies used were too high for optimum production of the 1n product. These results will be compared with predictions for the location of the excitation function maximum and the maximum cross section using the “Fusion by Diffusion” theory proposed by Swiatecki, Siwek-Wilczynska, and Wilczynski.

DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or The Regents of the University of California.

Ernest Orlando Lawrence Berkeley National Laboratory is an equal opportunity employer.

ACKNOWLEDGEMENT

This work was supported in part by the Office of High Energy and Nuclear Physics, Nuclear Physics Division, United States Department of Energy under contract number DE-AC03-76SF00098.