

LEVEL STRUCTURE IN  $^{141,143}\text{Eu}$  STUDIED BY ( $^6\text{Li},\text{xn}$ ) REACTIONS

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We have acquired excitation functions, three parameter gamma-gamma coincidence data, and angular distribution data for  $^{143}\text{Eu}$  at the Indiana University Cyclotron Facility using the  $^{142}\text{Nd}(^6\text{Li},5\text{n})$  reaction at 65 MeV. The results of these experiments were presented at the 1977 Fall Meeting of the Division of Nuclear Physics.

During the coincidence experiment  $23 \times 10^6$  events were recorded on magnetic tape for analysis at Notre Dame. The 50  $\mu\text{s}$  half-life of the isomer prevents sorting for preceding radiation, but two of the gamma-rays seen in our singles spectra (the 917 and 668 keV transitions) were identified by Firestone<sup>1</sup> and Wisshak<sup>2</sup> as preceding the isomer.

Prompt coincidence spectra obtained by using the 917 and 668 keV transitions as gates established two cascades which terminate at the  $11/2^-$  isomer and apparently are not connected by inter-cascade gamma-ray transitions. There is some evidence for a few weaker transitions which we have not been able to place in the cascades. Not all of the interesting sorts have been completed and analysis of the coincidence data is continuing.

The angular distribution data indicate that the 917-1072-252 keV cascade is composed of pure quadrupole transitions; implying levels of  $I^\pi=15/2$ ,  $19/2$ ,  $23/2^-$  at 1306, 2378 and 2630 keV respectively. The results for the transitions of the other cascade are much less definite. However, the 668 keV

transition does seem to be a  $13/2^- \rightarrow 11/2^-$  dipole-quadrupole admixture.

The assignment for the 668 keV transition agrees with the decay data of Firestone<sup>1</sup> and the results which Wisshak<sup>2</sup> obtained from decay and in-beam data. The assignment for the 917 keV transition also agrees with Wisshak's results.

Using the  $^{142}\text{Nd}(^6\text{Li},7\text{n})$  reaction at 84 MeV we have acquired three parameter gamma gamma coincidence data and angular distribution data for  $^{141}\text{Eu}$ . Analysis of these data is in progress.

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- 1) R.G. Firestone et al., Annual Report, Michigan State University Cyclotron Laboratory 1975-76.
- 2) K. Wisshak et al., Zeitschrift für Physik, A277, 1976.