

Abstract Submitted  
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**Search for isomers in  $^{199-203}\text{Tl}$**  N. FOTIADES, R.O. NELSON, M. DEVLIN, LANL, J.A. BECKER, W. YOUNES, LLNL — The  $^{203}\text{Tl}(n, xn\gamma)$  reactions were used to study excited states in  $^{199-203}\text{Tl}$  isotopes. The data were taken using the GEANIE spectrometer comprised of 26 high-purity Ge detectors. The pulsed neutron source of the Los Alamos Neutron Science Center's WNR facility provided neutrons in the energy range from 0.6 to 250 MeV. The time-of-flight technique was used to determine the incident neutron energies. Partial  $\gamma$ -ray cross sections were measured from the beam-on data while half-lives of isomers were determined from the beam-off data. A candidate for the unknown  $9/2^-$  isomer in  $^{203}\text{Tl}$  has been identified. The half-life of this state is less than the shortest half-life that could be determined in the present experiment (typically, the half-lives that can be currently measured with GEANIE vary between a few  $\mu\text{s}$  to a few ms). The candidate state is located at 1484-keV excitation energy, in excellent agreement with the theoretical prediction for the excitation energy of the  $9/2^-$  state in Ref. [1]. In  $^{202}\text{Tl}$ , for the previously known  $7^+$  isomer at 950-keV excitation energy a  $592(4) \mu\text{s}$  half-life was obtained in the present work, which differs by  $\sim 4\%$  from the value adopted in the literature [ $572(7) \mu\text{s}$ ]. In the lighter Tl isotopes, the life-time measurements yielded results in agreement with previously known values reported in the literature. This work was supported by the U.S. Department of Energy under Contracts No. DE-AC52-06NA25396 (LANL) and W-7405-ENG-48 (LLNL).

[1] G. E. Arenas Peris and P. Federman, Phys. Rev. **C 38**, 493 (1988).

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