

Weak Gamma Rays in the Electron-Capture Decay of ^{194}Au *

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The electron capture decay of ^{194}Au has been extensively studied before, and the spectroscopic and nuclear data have been evaluated and published in Nuclear Data Sheets [1]. However, recently available large Ge detectors and high-efficiency Ge detector arrays have provided the opportunity for detecting weaker gamma rays in singles and coincidence experiments, and thus, to verify and extend results from previous measurements.

We produced two sources of ^{194}Au . A source for measuring gamma rays in a singles experiment was made by irradiating a foil of natural platinum with 10-MeV protons in the cyclotron of the Instituto de Pesquisas Energeticas e Nucleares (IPEN) at the University of Sao Paulo, Brazil. Another source for gamma-gamma coincidence experiments using the (LBNL) High-Energy-Resolution-Array (HERA) was made by bombarding a gold foil with 40-MeV protons from the 88-Inch Cyclotron.

Our measurements produced a wealth of gamma-ray data (167 transitions between singles, coincidence, and angular correlation measurements). The complete list of gamma rays measured in this work has been published [2], and some preliminary results have already been included in the most recent data evaluation of ^{194}Au [3]. We found thirty three gamma rays that had not been previously observed in the electron-capture decay of ^{194}Au , and several coincidence results that have significantly affected its decay scheme. These data have confirmed levels in ^{194}Pt at 1373- and 1737 keV, and established new placements in the decay scheme for the 59-, 223-, 304, and 562-keV transitions. A paper describing these results have recently been submitted for publication [4].

Footnotes and References

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1. B. Singh, Nuclear Data Sheets **56**, 75 (1989).
2. R.R. Plaza Teixeira, *Espectroscopia Gama e Correlação Angular Gama Gama em ^{194}Pt* ; Ph. D. Thesis, University of Sao Paulo, Brazil, 1996.
3. E. Browne and B. Singh, Nuclear Data Sheets **79**, 277 (1996).
4. R. R. P. Teixeira *et al.*, Phys. Rev. C (submitted).