

Abstract Submitted
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Precise β^- - and γ -ray emission probabilities in the decay of ^{67}Cu ¹ JUN CHEN, FILIP KONDEV, IRSHAD AHMAD, MICHAEL CARPENTER, DAVID EHST, JOHN GREENE, VAKHTANG MAKARASHVILI, NICK SMITH, SHAOFEI ZHU, Argonne National Laboratory — The ^{67}Cu radionuclide has a potential for wide applications in cancer therapy and SPECT imaging. However, important decay properties that impact those applications are determined from a single measurement that was carried out about 60 years ago and reported without any uncertainties [1]. We have performed new measurements using chemically-purified ^{67}Cu sources, produced via the $^{68}\text{Zn}(\gamma, p)$ reaction [2], in conjunction with the γ -ray spectroscopy technique. Both single and $\beta\gamma$ -coincidence experiments were carried out using LEPS (γ rays) and PIPS (β^- and CE) detectors. Absolute β^- and γ -ray emission probabilities were determined and those were found to differ significantly compared to the previously adopted values. The details of those measurements will be presented and their impact on the application of ^{67}Cu as a therapeutic radionuclide in cancer therapy, as well as on various production-reaction cross sections, will be discussed.

[1] H.T. Easterday, Phys. Rev. 91, 653 (1953).

[2] N.A. Smith, D.L. Bowers and D.A. Ehst, Appl. Radiat. Isot. 70, 2377 (2012).

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