

ABSTRACT

The neutron capture cross sections of ^{175}Lu and ^{176}Lu have been measured in the energy range from 3 to 225 keV at the Karlsruhe 3.7 MV Van de Graaff accelerator. Neutrons were produced via the $^7\text{Li}(p, n)^7\text{Be}$ reaction by bombarding metallic Li targets with a pulsed proton beam and capture events were registered with the Karlsruhe 4π Barium Fluoride Detector. The cross sections were determined relative to the gold standard using isotopically enriched as well as natural lutetium oxide samples. Overall uncertainties of $\sim 1\%$ could be achieved in the final results, which are about a factor of five more accurate than previous data. Maxwellian averaged neutron capture cross sections were calculated for thermal energies between $kT = 8$ keV and 100 keV. These values are systematically larger by $\sim 7\%$ than reported in recent evaluations.