Measurement of neutron capture cross section of ^{62}Ni in the keV region

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The neutron capture cross section of ^{62}Ni, relative to gold as a standard, was determined in the energy range from 250 eV to 100 keV. This energy range covers the region between 5 keV to 20 keV, which is not available in ENDF. Capture events are detected with the 160-fold 4π BaF_2 Detector for Advanced Neutron Capture Experiments (DANCE) at the Los Alamos Neutron Science Center. One of the challenges was to process the high count rate of 4 events/μs, which required an optimization of the data acquisition software. The neutron energy was determined by the time of flight technique using a flight path of 20.25 m. The sample mass of the 96% enriched ^{62}Ni target was 210 mg and it was mounted in a 1.5 μm thick Mylar foil. A Maxwellian average cross section was calculated in the temperature range relevant for the s-process.

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