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γ-spectroscopy of low spin states of 232Ac following the β- decay of 232Ra

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The structure of the odd-odd 232Ac nucleus, produced in the β–decay of 232Ra, was investigated through γ-ray spectroscopy at the ISOLDE Decay Station at ISOLDE, CERN. A radioactive beam of 232Fr was implanted in the IDS. The γ-rays originating from the β –decay chain 232Fr - 232Ra - 232Ac - 232Th were registered using a mixed array consisting of 4 HPGe Clover and 2 LaBr3(Ce) detectors arranged in a close geometry.

Prior to our study, only very limited information was available for the 232Ra - 232Ac β–decay coming from a study in 1986. In that experiment, the multinucleon transfer reaction was used to produce the precursor 232Ra. Due to low statistics and the absence of γ-γ coincidences, only a few γ-ray transitions were associated with 232Ac. In this work, we report a revised and considerably extended level scheme for 232Ac by ascribing 25 new γ-transitions that link 15 new excited states. An isomeric state at Ex=97.7 keV was identified and its lifetime was measured using the HPGe detectors. The experimental results will be discussed and compared with the available literature data for the neighbouring 230Ra β–decay.

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