

RESOLUTION-ENHANCED SPECTROSCOPY OF ^{81}Y ¹

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The fusion-evaporation reaction $^{58}\text{Ni}(^{32}\text{S}, 2\alpha p)$ has been used to study the neutron-deficient isotope ^{81}Y . Multiple particle- γ -ray coincidences have been detected by the GAMMASPHERE array combined with the MICROBALL charged-particle detector system. Gamma-ray spectra with an improved resolution have been achieved from an event-by-event determination of the nucleus recoil momentum, thus allowing a precise Doppler-shift correction. In this way a resolution enhancement by a factor 2 was obtained for a 1 MeV γ line. During the analysis an E_γ - E_γ matrix as well as an E_γ - E_γ - E_γ cube have been used to extend the previously known level scheme to higher spin ($I \approx 57/2$) and excitation energy ($E_x \approx 17$ MeV). More than 100 new γ rays and 80 new levels have been added to the level scheme and six new bands have been established. The interpretation of these bands in terms of the cranking model and their comparison with similar bands in neighboring nuclei is discussed.

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