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Beta-delayed neutron and two-neutron emission in the 78Ni region RIN YOKOYAMA, ROBERT GRZYWACZ, University of Tennessee, Knoxville, BERTIS RASCO, NATHAN BREWER, KRZYSZTOF RYKACZEWSKI, Oak Ridge National Laboratory, IRIS DILLMANN, TRIUMF, JOSE-LOUIS TAIN, Instituto de Fisica Corpuscular, Valencia, SHUNIJI NISHIMURA, RIKEN Nishina Center — Beta-delayed neutron emission is found in neutron-rich nuclei where the decay energy window is high enough to populate states above the neutron separation energy in the daughter nucleus. Understanding of the neutron emission process is important since one, or even multiple neutron emissions are the dominant decay modes for the neutron-rich nuclei along the r-process path and the branching ratios change the final abundance. However, experimental data of multi-neutron emission properties for the r-process nuclei are almost non-existent. One-neutron and two-neutron branching ratios (P_{1n} and P_{2n}) have been measured in the decay of neutron-rich $^{84-87}$Ga at the RI-beam Factory (RIBF) at the RIKEN Nishina Center using a high-efficiency array of ^{3}He neutron counters (BRIKEN). The experimental P_{xn} values agree with theoretical calculations only when Hauser Feshbach statistical model is included [1]. The P_{xn} results demonstrated the necessity of the statistical model as a two-stage model that can take one-neutron emissions from two-neutron unbound states into account. Gamma-ray spectroscopy results provide additional information for confirming the statistical model in beta-delayed neutron emission. [1] R. Yokoyama et al., Phys. Rev. C 100, 031302(R) (2019)

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