The inclusive nature of this experiment precludes any clear statement concerning both the nature of and reason for this abrupt change in emission source topology. One possible explanation would be that angular momentum is playing a more important role at higher energies, thus increasing the importance of heavy element emission from the equilibrated compound nucleus. Another possibility would be that sequential or instantaneous multifragmentation, which should be characterized by a significantly different charge distribution, may be enhancing the yield of heavy elements in the equilibrium emission source beyond E/A $\approx$ 50 MeV. Clearly, further investigations of an exclusive nature utilizing detector systems with a large geometric efficiency must be performed to examine this phenomenon more closely.

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OCTUPOLE CORRELATIONS IN ^{145,146}Nd NUCLEI

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For the ^{146}Nd nucleus, calculations indicate an enhancement of octupole correlations at medium spins.[1] It has been predicted that with increasing rotational frequency a reflection-asymmetric structure should become yrast. In this work we aimed to verify this prediction. To populate high spins in ^{146}Nd, we utilized the ^{136}Xe+^{13}C compound nucleus reaction using a solidified ^{136}Xe target and 54 MeV ^{13}C beam from the KVI cyclotron. The γ - γ coincidences were collected with 4 Ge detectors in anti-Compton shields. The level scheme resulting from these data is shown in Fig. 1a. An interesting result of the present work is an extension of the ground state, alternating-parity band up to spin I=14. It is possible, though at present still speculative that the I=18 level at 5900.5 keV and the I=19, level at 6195.0 keV are also members of this band. An analogous 18 and 19 levels have been found at similar excitation energies in other N=86 nuclei.

The above observations support the prediction that the octupole correlations extend in ^{146}Nd to high spins. As in ^{148}Sm one observes here a competition between octupole and single-particle, reflection-symmetric excitations. The presence of a short cascade built on top of the 8^+, 2475.1 keV level and the $(f^2_{7/2})_{2+,4+,6+}$ excitations on top of the

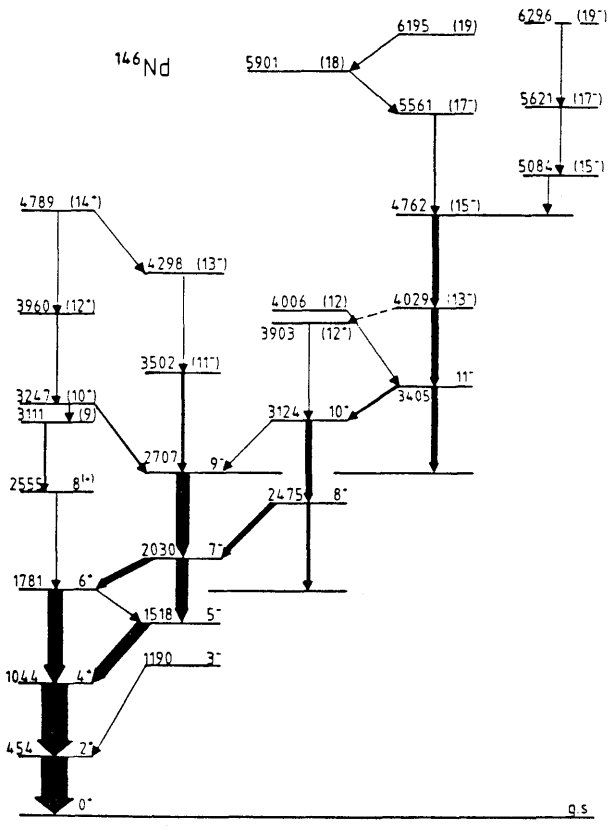

Figure 1a. Level scheme of ^{146}Nd.

11^-, 3405.1 keV level suggest an interpretation of these levels as a $\nu(h_{9/2},f_{7/2})^{max}_{8^+}$ and $\nu(i_{13/2},h_{9/2})^{max}_{11^-}$ single particle configurations respectively by analogy to a similar excitations in the N=86 isotones.

In Fig. 2, B(E1) values as deduced from B(E1)/B(E2) branching ratios, are presented which are comparable to B(E1) rates in nuclei with octupole deformations. The above observations support the prediction that the octupole correlations extend in ^{146}Nd to high spins.

The level scheme of ^{145}Nd presented in Fig. 1b has been obtained by analyzing the data from the same run. The level scheme obtained agrees with and extends that published previously data.[2] We placed 15 new γ-transitions and a couple of levels into the scheme. An important finding is the 716.0 keV transition between the 3137.0 keV level and the I=21/2, 2421.1 keV level. Based on this coincidence, the order of the 602.6 keV and 380.7 keV transitions proposed in Ref. 2 has been reversed and the I=23/2, 3137.0 keV level has been introduced instead of the 25/2, 2914.7 keV one proposed in Ref. 2. The data allow a systematic comparison with other N=85 nuclei as shown in Fig. 3. The data for ^{149}Gd has been taken from Ref. 3 and for ^{147}Sm from our study.[4]

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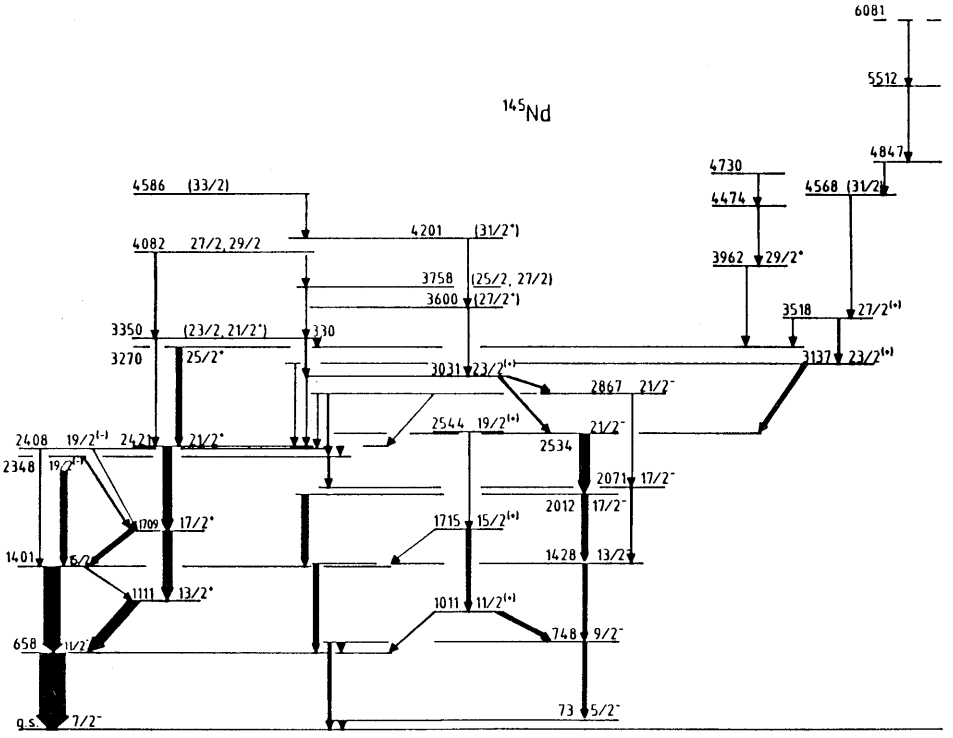
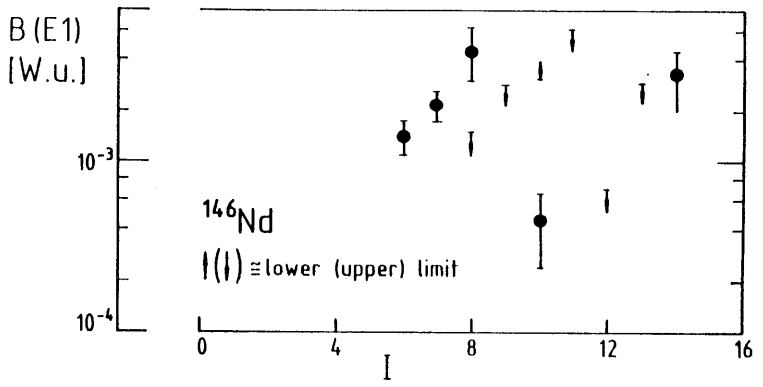


Figure 1b. Level scheme of ^{145}Nd.

Figure 2. Ratio of B(E1)/B(E2) for the case of ^{146}Nd.



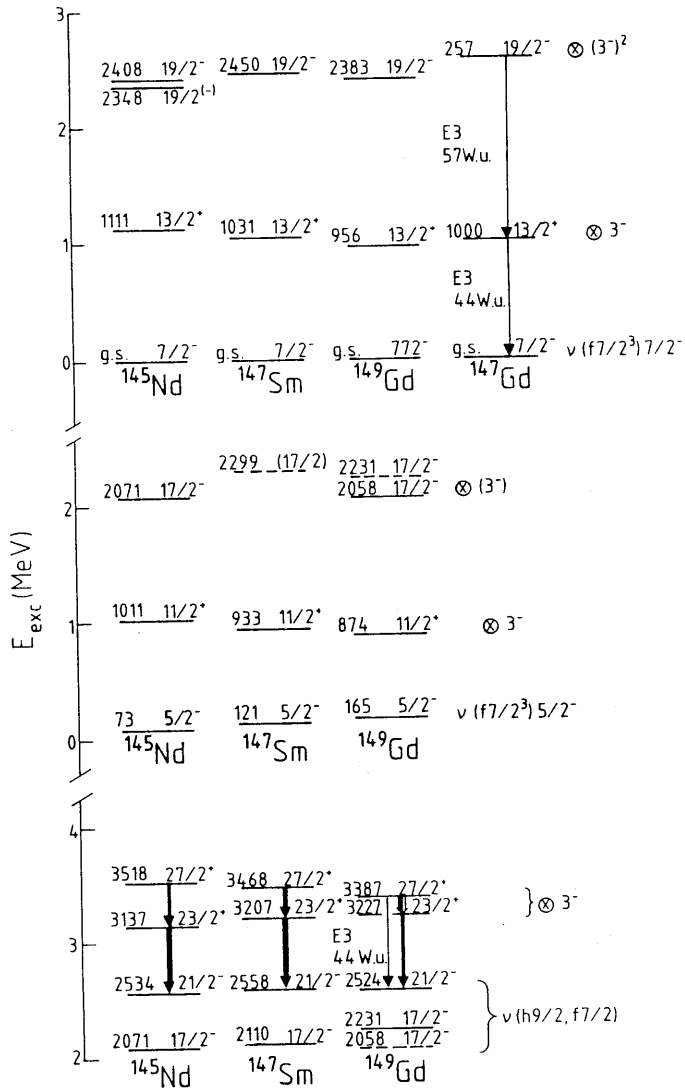


Figure 3. A systematic of octupole excitation in N=85, odd-A nuclei.